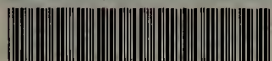


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Characterization of the 1986 Metallic Mining Workforce

By Shail J. Butani and Ann M. Bartholomew



UNITED STATES DEPARTMENT OF THE INTERIOR

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

h	hour	pct	percent
yr	year		

CHARACTERIZATION OF THE 1986 METALLIC MINING WORKFORCE

By Shail J. Butani¹ and Ann M. Bartholomew²

ABSTRACT

In 1986 the Bureau of Mines conducted a probability sample survey, Mining Industry Population Survey, to measure such employee characteristics as occupation; principal equipment operated; work location at the mine; present job, present company, and total mining experience; job-related training during the last 2 years; age; sex; race; and education. The population estimates are necessary to properly analyze the Mine Safety and Health Administration (MSHA) injury (includes illness and fatality data) statistics; that is, to compare and contrast injury rates for various subpopulations in order to identify those groups that are exhibiting higher than average injury rates.

This report uses the survey's results to characterize the U.S. metallic mining workforce from March through September 1986. Similar reports have been published for the stone, sand and gravel, and nonmetallic mining industries, as well as for the entire metal and nonmetal mining (includes metallic, stone, sand and gravel, and nonmetallic industries) sector and the coal mining sector.

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INTRODUCTION

According to the occupational safety and health (OSH) statistics published annually by the U.S. Department of Labor, Bureau of Labor Statistics, the mining industry (excluding oil and gas extraction) always has had one of the highest injury incidence rates among the major industry divisions. One of the primary objectives of the Bureau of Mines is to conduct research in the area of health and safety of the nation's miners, aimed at reducing the incidence rate of work-related injuries (includes illnesses and fatalities) in the domestic mining industry. In order to reduce the overall incidence rate, the Bureau needs to identify which groups or subpopulations of the workforce are exhibiting higher than average incidence rates.

To identify the high-risk groups, information about the injured workers and about the entire workforce is required. Present regulations permit MSHA to collect information on all mine injuries requiring medical attention. Hence, a data base containing various characteristics on the *injured* workforce is available. Since similar information about the *entire* workforce was not available, the Bureau conducted a probability sample survey called the Mining Industry Population Survey (MIPS), also known as the demographics survey, to collect the necessary data. The 1986 survey measured the following characteristics: job title or occupation, principal equipment operated, work location at mine, experience at present job, experience at present company, total mining experience, job-related training during the last 2 years, age, sex, race, and education. This demographics survey provided information about the population at risk and will aid research in pinpointing the hazardous segments of the population, as illustrated by the following example.

From MSHA's injury data base, it is known that 2,207 males and 51 females working in the U.S. metallic mining industry were injured in 1986. If information about the population at risk (i.e., the number of male and female workers for the metallic mining industry in 1986) is not known, then it is not valid to draw the conclusion that male miners are at a much higher injury risk than female miners. The estimates from the demographics survey show that there were a total of 33,542 male workers and 2,255 female workers (table E-15) employed in U.S. metallic mining in 1986. Of these workers, the nonoffice workforce identified by occupation

or job title consists of 32,735 males and 1,182 females (table E-7). The reason for excluding office workers from the analysis is to account for some of the obvious difference in job risk. It should be noted that in the office worker category only 2 pct are males and 48 pct are females (table E-15). The added information on the population puts the injury statistics in a better perspective, as shown in table 1.

Table 1.—Population and injury statistics for 1986 metallic mining sector

	Population statistics		Injury statistics			
	Workers	pct	Injuries	pct	Lost workdays	pct
Male	32,735	96.5	2,207	97.7	30,162	97.8
Female . .	1,182	3.5	51	2.3	686	2.2
Total . . .	33,917	100.0	2,258	100.0	30,848	100.0

Since the difference between the distribution of workers and injuries, as well as lost workdays, is relatively large, it would be interesting to further investigate the source of variation. Could the source of variation be job mix by sex?

Hence, the present research will aid in finding solutions to reduce the injury incidence rates for the high-risk groups. That is, the collected information will be used to compare and contrast the demographics composition of the hazardous groups with those of the safer groups. Thus, through present research, the differences and similarities between the two groups can be defined.

The purpose of this report is to provide the U.S. metallic mining population estimates for March through September 1986 by various characteristics. This information is essential to performing the injury data analysis that is the ultimate goal of the survey.

In addition to this report, there are three companion reports (1-3)³ covering the stone, sand and gravel, and nonmetallic mining industries. Summary reports have been published for the entire metal and nonmetal mining industry (4) and the coal mining industry (5).

ACKNOWLEDGMENTS

The authors thank the officials of the U.S. Department of Labor, MSHA, for submitting the MIPS justification package to the Office of Management and Budget for its clearance to collect the data. Special thanks go to Kathy Snyder, public affairs specialist, Office

of Information and Public Affairs, MSHA, for initiating the study, and to Edwin Thomasson, research liaison officer, Technical Support, MSHA, for his continuous effort and support.

SURVEY METHODOLOGY

POPULATION

The MIPS covered all workers employed in the anthracite coal (SIC 111),⁴ bituminous coal (SIC 121), metal (SIC 101-106, 109, 281), stone (SIC 141, 142, 324, 327), sand and gravel (SIC 144), and nonmetal (SIC 131, 145, 147, 149, 289, 299) mining industries of the United States during the period March through September 1986. This report gives estimates only for the metallic mining sector.

The information pertaining to the mine employees included in the survey was collected through the mine operators, because a comprehensive sampling frame (name and address file) of the workers

in mine establishments was not available, and cost considerations prohibited the data collection through personal visits. The number of universe units (establishments under MSHA's jurisdiction) covered by the scope of this survey was approximately 18,350, with a total employment level of about 350,000. The number of establishments and employment for the metallic mining was about

³Italic numbers in parentheses refer to items in the list of references preceding the appendixes at the end of this report.

⁴The Standard Industrial Classification (SIC) was revised in 1987; the industry group numbers used here are those in effect at the time of the MIPS.

620 and 39,000, respectively. The scope of the data for the employees covered by this survey is the same as that of the data collected by MSHA form 7000-1 for mine accidents, injuries, illnesses, and fatalities, and MSHA form 7000-2 for quarterly mine employment. The collection of the fundamental statistics reported on these two forms is required by law (30 U.S.C. 813; 30 CFR 50).

SAMPLE

The principal feature of the survey sample design was its use of two-stage stratified random sampling. The primary sampling units (first stage) were the mine establishments; the secondary sampling units were employees within each of the chosen mine establishments. The characteristics used to stratify the primary units were the industry (anthracite coal, bituminous coal, metal, stone, sand and gravel, nonmetal); mine type (underground, surface, plant or mill); employment size class (1-19, 20-49, 50-99, 100-249, 250-499, 500-999, 1,000 and above); and status code (active, intermittent). Since the first three stratification characteristics are highly correlated with the characteristics that the survey was to measure, use of stratified sampling increased the efficiency of the sample design and thus resulted in a smaller required sample size. The fourth characteristic, status code, was chosen so that nonresponse adjustment could be made within more homogenous groups. This is desirable because proportionately higher numbers of nonmailable, out-of-business, refusal, etc., responses are reported from intermittent mine establishments than from active mine establishments.

The sampling frame used for this survey was the 1985 preliminary address and employment file maintained by MSHA. A probability sample of 220 metallic mining establishments from a universe of 617 metallic mining establishments was selected by stratifying the frame as previously described and using a systematic sampling procedure with a random start for each stratum. The employees within an establishment were selected by using a systematic sampling procedure with a common random start for each employment size class.

A brief description of the sample allocation is as follows. For larger employment size classes, the allocation procedure placed all of the establishments on the frame in the sample as primary sampling units from which the employees were subsampled at a low frequency rate. As employment size class decreased, smaller and smaller proportions of the establishments were included as primary sampling units, but the employees within the establishments were subsampled at a higher frequency rate. The use of this procedure gave each employee, to the extent possible, about the same probability of inclusion in the sample, thus reducing the sampling variability. In order to limit the response burden for any one establishment, a maximum sample of 50 employees per establishment was selected.

DATA COLLECTION

The MIPS was conducted from March through September 1986 by mail questionnaire through the Bureau's Twin Cities (MN) Research Center. A reproduction of the original letter, followup letter, and the questionnaire bearing the Office of Management and Budget clearance number authorizing collection of the data are included in appendix F.

The response status for the metallic mining sector from the original and followup mailings, as well as from telephone calls to the nonrespondents, is summarized here. From a total population of 617 metallic mining establishments, the survey sampled 220 operations. The *overall response* and *rate* were 211 and 96 pct, respectively. There were 44 out-of-scope returns (i.e., out of businesses, nonmailables, duplicates, temporary inactives, and new

businesses under construction); the remaining 176 returns were within the scope of the survey (i.e., nonrespondents, usable, refusals, and unusables). Of the 176 in-scope records, 138 were usable. Thus, the survey achieved a *usable response rate* of 78 pct.

A brief description of the response terms follows:

<i>Response code</i>	<i>Description</i>
Nonrespondent	Received no response from the establishment.
Usable	Establishment provided usable data.
Refusal	Establishment refused to provide any data.
Unusable	Establishment provided data that were not in usable format.
Nonmailable	Establishment's address was either insufficient or wrong.
Duplicate	Data were combined with another establishment's data.
Out-of-business	Establishment was permanently closed.
New business	Establishment was in development stage.
Temporary inactive	Establishment was temporarily not operating.

As part of the data collection phase, all the returns were reviewed and edited for completeness and reasonableness of the data. Whenever there were inconsistencies, the respondents were called for reconciliation. Also, almost all of the respondents that had initially refused to participate in the survey were contacted by phone. Approximately 80 pct of these respondents ultimately supplied data. Adjustments for those mine establishments that did not supply the data, or supplied partial data, are explained in the "Estimation Procedures" section and in appendix C.

DATA CODING, ENTERING, AND EDITING

The returns underwent a very comprehensive review and editing process in order to (1) minimize the reporting differences among the respondents (establishments), (2) ensure consistency of coding among the individual worker entries, (3) ensure the accuracy of the data entry, and (4) ensure compatibility of occupation and equipment coding with the MSHA injury data base.

ESTIMATION PROCEDURES

In a simple random sampling plan, all units are sampled with the same sampling ratio. To derive the population estimates, the sample units are weighted (replicated) by the inverse of the sampling ratio. Because of efficiency consideration, the data for this demographics study were collected using a complex survey design. Hence, the data for each worker, the ultimate sampling unit, were not equally weighted. Instead, the population estimates were derived by weighting data for each worker with the appropriate final weight of the data, which was the product of the following three factors: (1) the inverse of the sampling ratio with which the primary sampling unit (establishment) was sampled; (2) a nonresponse adjustment factor that was computed separately for each sampling stratum and assigned to all responding establishments in a stratum to account for those establishments in that stratum that did not respond; and (3) the inverse of the sampling ratio with which the secondary sampling units (workers) were selected. A detailed discussion of

the different weights and estimation formulas are given in appendix C. In statistical terms, the survey's estimates of the population total were based on a Horvitz-Thompson estimator (6).

No adjustment was made for partial nonresponse. That is, the characteristics that were left blank by the respondents were coded as unspecified and were, naturally, weighted by their appropriate final weight in computing the population estimates. The percentage unspecified for a particular characteristic gives the user an indication of the completeness of the schedules.

GROUPING OF CHARACTERISTICS

The original data base has detailed data for the characteristics mentioned below. For purposes of publication, the detailed data were combined into groups. Please contact the authors to obtain detailed data or a different grouping of the data for any or all of the characteristics.

Job Title and Principal Equipment Operated

Since the original data base has about 100 codes for each of these two categories (see appendixes A and B), the entries were combined into 20 to 25 groups. Similarities of the job title or principal equipment operated and number of workers in each entry were two of the main criteria used in forming the groups.

Employment Size Class

The classes used for this characteristic are the standard size class definition used by MSHA. Because there were very few mines for the size class having 1,000 or more employees, the estimates for this class were computed separately and then were combined with the estimates for employment size class 500 through 999 in order to protect the confidentiality of the mines as well as the workers. The combined size class is labeled as 500+.

Present Job, Present Company, and Total Mining Experience

The data for all three of these characteristics were coded only as the number of years. It was felt that data were not reliable enough to be accurate to the month. The groupings were formed to be as compatible as possible to the groupings used by MSHA for its injury statistics.

Job-Related Training During Last 2 Years

The grouping for this characteristic was formed to reflect the definite and logical intervals that various mine operators employ and that meets the need of the mine safety personnel. The most frequently reported number was 16 h for training during the last 2 years; this is because MSHA requires a minimum training of 8 h/yr. Also, MSHA and safety personnel are interested in knowing the percent of workers who receive no training. Hence, both 0 and 16 h were categorized separately.

Age

The groupings for age were formed to be about the same as what MSHA uses for its injury statistics.

RELIABILITY OF ESTIMATES

As stated in reference 7:

All estimates derived from a sample survey are subject to sampling and nonsampling errors. Sampling errors occur because observations are made on a sample, not on the entire population. Estimates based on the different possible samples of the same size and sample design could differ. Nonsampling errors in the estimates can be attributed to many sources, e.g., inability to obtain information about all cases in the sample, mistakes in recording or coding the data, definitional difficulties, etc.

Nonsampling errors occur in a census as well as in a sample survey. As mentioned earlier, the completed forms underwent a very comprehensive review and edit process. This was primarily done to minimize the nonsampling errors.

In a probability sample, the coefficients of variation (CV's), which are a measure of the sampling errors in the estimates, can be estimated from the survey data. CV's were calculated for the basic characteristics as part of the survey estimation process; these CV's as well as the corresponding estimates for number of workers are given in tables E-41 through E-48. The CV's for other estimates can also be derived if requested. The methodology used to compute the estimated CV's is given below.

By definition, the CV of any sample estimate is equal to the standard error of the estimate divided by the value of the estimate (8). In other words, it is a measure of relative variation. Because the survey data will be used by numerous researchers to measure different statistics (e.g., totals, means, medians, percentages) by various cross-classification categories, it was not feasible to use the exact formula for the standard error estimates. Hence, a generalized formula that approximated the exact formula and that was easy to implement for computing all the standard error estimates was developed. It should be noted that since the survey uses a complex sampling design, the usual variance, standard deviation, and standard error estimates computed by the software packages are no longer valid because they are based on simple random sample design. The reliability measures for this survey were computed by employing a random group variance technique. A brief description of it is given in appendix D and a detailed discussion is given in reference 9.

The purpose of producing a reliability measure for this report is to define the confidence interval or range that would include the comparable complete coverage value. For example, the total number of estimated truck drivers for the 1986 metallic mining industry was 2,184 (table E-1 and E-42) with a CV of 3.6 pct (table E-42) with a CV of 8.4 pct (table E-42). Based on this information, the standard error on the total number of truck drivers is 183 (estimate \times CV = $2,184 \times 0.084$) and the 95-pct confidence interval is 1,818 to 2,550 ($2,184 \pm 2 \times 183$). This means that with 95 pct confidence, it can be said that the interval 1,818 to 2,550 includes the total number of truck drivers in the stone mining industry that would have been obtained from a census of the frame.

In general, the smaller the subpopulation size, the larger the variability in the estimates. Additionally, the larger the nonresponse, the less reliable the estimate may be. As mentioned earlier, nonresponse error is considered a nonsampling error. This error occurred more frequently for estimates of job-related training during the last 2 years and total mine experience than for other variables because conceptually these variables are harder to report. Moreover, it is possible that the training estimates might be somewhat biased because many respondents filled in 16 h, the minimum number of hours required by MSHA over a 2-year period.

VALIDATION OF ESTIMATES

Once the estimates were produced, they were validated for accuracy and reasonableness by several mining industry specialists. Additionally, the total employment for each industry was compared to an independent census conducted by MSHA, the results of which are reported in references 10 through 14. The injury experience reports tabulate the injury-illness-fatality data reported to MSHA on form 7000-1 and employment data reported on form 7000-2. While the data base used to compile the statistics for these reports contains detailed information for the injured victims, it does not contain similar information for the entire workforce. The breakdown of total employment is available only by type of ore mined, employment size class, and work location. Hence, the MIPS was conducted so that MSHA injury data could be analyzed in greater detail.

The data show that the overall employment figures from the two sources differed about 9 pct for the metallic mining industry, with the MSHA figures being higher than those of the demographic survey. The difference in the estimates is caused in part by differences in reporting, coverage period, definitions, and methodology as explained below for data comparison by employment size class and by work location.

When comparing distribution of workers by employment size class, the differences between the data of the total row of table E-1 of this report and MSHA data as stated in table 4 of reference 10 are substantial. This is mainly due to the differences in definition and methodology. The MIPS classification is based on total employment of an establishment as it existed when the respondents filled out the questionnaire. MSHA collects employment on a quarterly basis, and for each quarter it is possible for the employment to be broken into a maximum of four different work locations; hence, each establishment may have up to 16 different employment figures.

Per MSHA's methodology, the size groups are classified according to the lowest numbered (primary) subunit's average employment of four quarters and *not on the total employment of*

an establishment, as is the case with the MIPS. For example, if an establishment's annual average employment is 60, but the employment for the primary subunit, say underground, is 15, then the establishment per MSHA's methodology is classified in size class 1 through 19, whereas according to the MIPS procedure it is in size class 50 through 99. It is for this reason the average employment per operation as stated in table 4 of reference 10 is 4.3 for size class 1-4. It should be noted that MSHA classification overestimates the employment in smaller size classes.

In view of the above, the injury data as published in reference 10 by size class should not be analyzed against the MIPS employment size class data. Instead, the analyst needs to retabulate the MSHA injury data from the original data tapes so that the size class definition corresponds to the MIPS.

Also, a large difference existed between MIPS and MSHA figures for employment distribution by work location. This is primarily due to differences in reporting. The employment reported to MSHA every quarter is in aggregate numbers for each work location (maximum of four). Generally, this type of reporting results in gross approximations in the breakdown of variables such as employment. For the MIPS data, the work location was reported for each worker in the sample, in the same manner as it is reported to MSHA on form 7000-1 for each injured worker. It should be noted that the data on work location for individual workers is known with more specificity than for the whole population. Hence, it is appropriate to analyze the survey work location data with MSHA injury statistics.

Additionally, a small portion of the difference in the two estimates is due to the job title category of office workers. The MIPS underestimated the number of employees in this category because many respondents assumed that these workers very seldom incur injuries and therefore were not to be reported. For the purposes of injury analysis, the office workers are to be excluded because of some of the obvious difference in the injury risk. Hence, the difference in counts of office workers does not make any difference.

SUMMARY OF MAJOR FINDINGS

The findings of the survey by various cross-classifications are given as estimates in tables E-1 through E-40; tables E-41 through E-48 give reliability estimates for the basic characteristics and a detailed discussion of their use is given in the "Reliability of Estimates" section. If desired, the estimates by some other classification criteria including more detailed estimates (e.g., distribution of workers by age and experience at present company working at the plant or mill location) can be derived from the original data base. The following findings are based on the data for the entire 1986 metallic mining workforce.

- The total estimated workforce for 1986 was approximately 35,900 (table E-1). The data in table E-1 also indicate that only 10 pct of the workforce was employed in establishments with 49 or less employees, 27 pct in establishments with 50-249 employees, and 63 pct in establishments with greater than 249 employees. That is, the bulk of the employment was in larger establishments.
- Distribution of workers by work title varied greatly according to the employment size class (table E-1). This was especially true for the grouping manager-foreman-supervisor (general). In the employment size class 1-19, this category was 13 pct; however, in the size class 500+, it was 2 pct.

- Mechanic-welder-oiler-machinist was the largest category of workers, with 22 pct employment; plant operator-warehouseman made up another 15 pct; the laborer-miner-utility man category was 12 pct; and mine technical support, 11 pct (table E-1). Each of the remaining occupation groups had fewer than 7 pct of the employees.
- The distribution of workers by work location was underground mine, 14 pct; surface at underground mine, 5 pct; surface mine, 31 pct; plant or mill, 42 pct; and office 9 pct (table E-3). The distribution of workers by work location also varied greatly across size class.
- Mean hours of training during the last 2 years was highest (68 h) for driller-rock bolter category (table E-13).
- Of the female employees, 48 pct had the job title category office worker, compared with 2 pct of the males (table E-15).

The following findings are based on metallic mining data that exclude the job title category of office worker.

- The largest category of equipment operated was handtools (powered and nonpowered) with 23 pct of the employment (table E-2). This category was followed by categories none and plant equipment, with 18 and 12 pct, respectively.

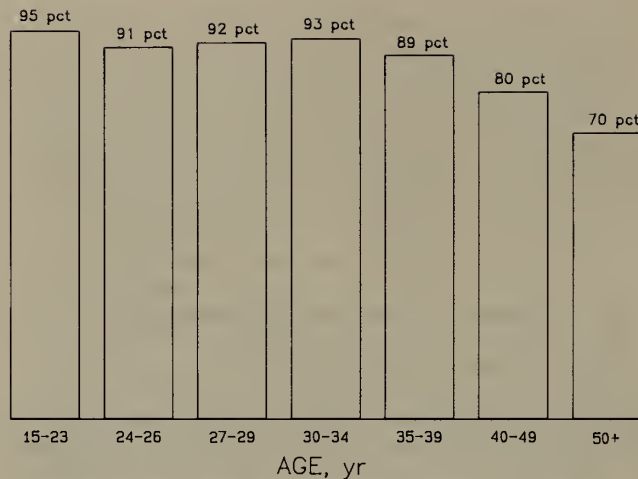


Figure 1.—Percentage of 1986 metallic mining workforce with at least a high school diploma, by age (excluding job title category of office worker, as well as workers whose education was unspecified).

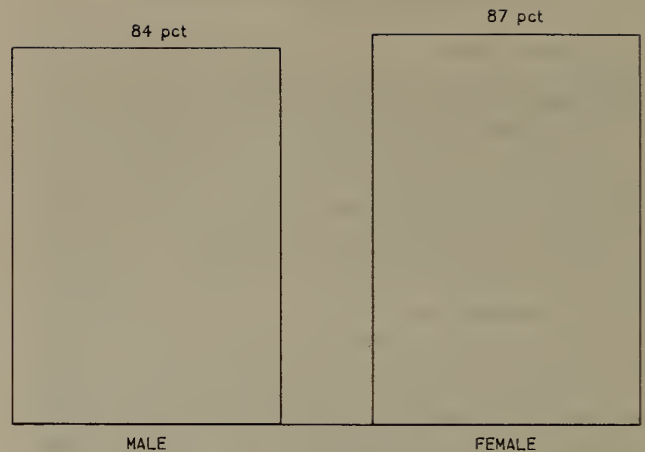


Figure 2.—Percentage of 1986 metallic mining workforce with at least a high school diploma, by sex (excluding job title category of office worker, as well as workers whose education was unspecified).

- The median experience at present job, present company, and total mining were 6, 10, and 12 years, respectively (table E-4).
- Mean job-related training during the last 2 years was 43 h (table E-5).
- Mean age was 40 years across all size classes (table E-6).
- Males made up 97 pct of the workforce (table E-7). Note that the 97-pct figure excludes the unspecified category.
- Whites, blacks, and Hispanics made up 85, 2, and 10 pct, respectively, of the workforce (table E-7). The remaining 3 pct workers belonged either to another race or were unspecified.
- Of those workers whose education was specified, 84 pct had a high school or better education (table E-7). Note that this figure is obtained by (1) summing the workers in the categories high school diploma, vocational diploma, some college, and college degree, and (2) dividing this sum by the total number of workers minus the workers in the unspecified category. In this case, it is 27,480 divided by 32,812.

- The distribution of workers by equipment operated varied considerably between males and females. This was especially true for the principal equipment categories handtools (powered and nonpowered), scale-lab equipment-controls, and none (table E-21). For example, scale-lab equipment-controls was the principal equipment operated by 26 pct of the females compared with 4 pct for males. Handtools was the largest principal equipment operated category for males (24 pct) but for females this category was 2 pct.
- Education and median experience at the present company were inversely related (table E-37); that is, on the average, the less educated the person was, the longer he or she was employed at the company.
- There was a higher percentage of employees with at least a high school education under the age of 40 than there were of age 40 and over (table E-38 and figure 1); education categorized by sex (table E-39) is shown in figure 2.

APPLICATION OF DATA FOR INJURY ANALYSES

The ultimate objective of this study is to provide a basis for—

1. Analyzing the 1986 MSHA metallic mining injury statistics and identifying those subpopulations exhibiting higher or lower than average injury rates.
2. Producing some selected estimates by geographic location such as regions (east, central, west), MSHA districts, or States, and performing injury data analyses.
3. Producing some selected estimates by SIC codes such as iron, copper, lead-zinc, etc., and performing injury data analyses.

4. Developing an easy to use computerized data base that would be available to the researchers to do their own analyses, especially in the area of targeting injury prevention and training efforts.

The results from these analyses, which encompass all facets of mining operations, can help identify areas where research efforts should be devoted to achieve the greatest safety improvements, thus preventing creation of unnecessary regulations or crash research programs that tend to waste funds.

RECOMMENDATIONS FOR FUTURE WORK

1. After the injury analyses are performed, and the hazardous areas or subpopulations have been identified, it would be desirable to further investigate their problems and needs. This can be accomplished by conducting some special surveys such as an equipment use survey, maintenance-related work survey, small mines survey, etc.

2. Repeat the MIPS and perform the injury analyses periodically, say every 3 to 5 years, in order to study the changing mining

environment and its impact on mining safety and productivity. When the survey is repeated, it is recommended that modifications be made to the questionnaire to reflect new needs. It is also recommended that the collection of total mine experience and job-related training data be eliminated, since these variables are conceptually very hard to measure. Also, the variables experience on the job and experience with the company should be measured in years only.

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APPENDIX A.—METALLIC MINING INDUSTRY JOB TITLE GROUPING

<i>Description</i>	<i>Job title code</i>
Backhoe-crane-dragline-shovel operator	367, 378, 778, 387
Beltman-belt repairman	601, 1012, 996
Blaster	807
Deckhand-barge and dredge operator	372
Dozer-heavy and mobile equipment operator	368, 768, 985
Driller-rock bolter	33, 34, 333, 334, 1056, 46
Electrician-lampman	402, 602, 603, 385
Front-end loader-forklift operator	382, 782, 825, 389
Grader-scraper operator	375, 775, 957
Laborer-miner-utility man	616, 53, 316, 36, 38, 39, 45, 57, 58, 59, 158, 216, 224, 327, 386, 395, 609, 624, 663, 710, 716, 874, 997, 1013, 1055
Manager-foreman-supervisor:	
General	430, 449, 481, 489, 494
Maintenance	418
Working	749
Mechanic-welder-oiler-machinist	404, 604, 605, 1019, 1018, 1060, 394, 608
Mine technical support	320, 393, 396, 414, 423, 456, 464, 495, 593, 594, 920, 921, 930, 965, 998, 1014
Office worker	497
Plant operator-warehouseman	374, 379, 380, 388, 390, 392, 1022
Shuttle car-tram operator	850, 28, 29, 269, 373, 728, 962, 969
Truck driver	376, 776

<i>Code</i>	<i>Description</i>	<i>Code</i>	<i>Description</i>
28.....	Scoop tram operator	269.....	Chute puller, underground
29.....	Mucking machine operator		Locomotive operator
33.....	Driller helper, underground		Car loader underground
34.....	Exploration driller, underground		Whistle punk, underground
	Longhole driller, underground	316.....	Service truck operator
	Prospect driller, underground		Laborer
	Diamond driller, underground		Track gang, surface
36.....	Continuous miner operator		Surface worker
38.....	Cutting machine operator		Utility man, surface
39.....	Hand loader		Pumper, surface
	Trammer		Tamping machine operator
45.....	Hangup man	320.....	Cage attendant, surface
	Rockman		Aerial tram—outside only
	Raise blaster	327.....	Surface miner
	Chute blaster	333.....	Driller helper
	Rock handler	334.....	Carriage-mounted drill operator, surface
46.....	Pinner		Wagon drill operator, surface
	Truss bolter		Churn driller, surface
	Rock bolter		Rotary drill operator
	Roof trimmer		JP drill operator, surface
	Roof man		Air-track driller, outside only
	Scaler operator	367.....	Backhoe operator
	Roof bolter		Power shovel operator
53.....	Nipper		Pitman
	Utility man	368.....	Dozer operator
57.....	Stope miner		Track operator helper, surface
58.....	DXC miner		Tractor operator, surface
	Drift miner	372.....	Deckhand
59.....	Raise miner		Dredge operator
158.....	Rock machine operator, underground		Barge attendant
216.....	Trackman		Barge loader
224.....	Trainees, underground		Boat operator

<i>Code</i>	<i>Description</i>	<i>Code</i>	<i>Description</i>
373	Car dropper	414	Laboratory assistant
374	Storekeeper		Analyst
	Blunger		Laboratory technician
	Process operator		Laboratory supervisor
	Sandbox operator		Quality control
	Mill operator		Dust sampler
	Reagent operator		Emission control specialist
	Car loader, surface	418	Maintenance supervisor
	Warehouseman		Maintenance foreman
	Shipping	423	Surveyor
	Media operator	430	Assistant mine manager
	Breakerman		Assistant mine foreman-vice president
	Crusher operator	449	Mine owner
	Sewing machine operator		Assayers
	Boney preparation plant operator		President
	Packaging		General foreman
	Cleaning plant operator		Mine manager
	Truck loader		Mine foreman
	Bagger-baler	456	Engineer
	Preparation plant operator		Metallurgist-geologist
	Cobber		Chemist
375	Grader operator, surface	464	Inspector
376	Truck driver, surface	481	Superintendents
378	Dragline operator		Project managers
	Dropball operator		Coordinators
	Crane operator, surface		Supervisors
379	Kiln operator	489	Outside foreman
	Calciner	494	Plant manager
	Dryer operator		Mill manager
380	Fine coal plant operator		Plant foreman
382	Loader operator		Mill foreman
	Front-end loader operator, surface	495	Safety coordinator
	Pan operator		Safety manager
	Scraper operator		Safety director
	Highlift operator		Environmental coordinator
	Payloader operator		Safety engineer
385	Lampman	497	Office help
386	Refuse truck driver		Computer operator
387	Rotary bucket excavator operator		Controller
388	Separator operator		Clerk
	Scalper	593	Nurse
	Shaker operator	594	Training specialist
	Screen operator	601	Conveyor man
389	Forklift operator		Belt walker
390	Silo operator		Belt installer
392	Washery operator		Tunnel worker
	Topman		Tailpiece man
	Skip dumper		Belt mover
	Binman		Mobile bridge carrierman
	Scrubber operator		Beltman
	Tipple operator-attendant	602	Lineman
393	Scaleperson		Electrician
	Weighman-weighmaster	603	Electrician helper
394	Carpenter		
395	Water truck operator		
396	Watchman		
	Security guard		
402	Master electrician		
404	Master mechanic		

<i>Code</i>	<i>Description</i>	<i>Code</i>	<i>Description</i>
604.....	Fueler	807.....	Chargeman
	Boilermaker		Shot firer
	Plumber		Powder man
	Pipefitter		Blaster
	Boiler operator		Airdox operator
	Pipe man		Loading hole shooter
	Boiler trainee		Powder monkey
	Mechanic	825.....	Bobcat operator
	Repairman	850.....	Ramcar operator
	Mill wright		Shuttle car operator
605.....	Mechanic helper		Buggy operator
608.....	Mason	874.....	Mine equipment operator
609.....	Supplyman	920.....	Cager
	Material man	921.....	Hoist operator
616.....	Rock picker		Hoist engineer
	Parts runner		Shaftman
	Groundman	930.....	Skip tender
	Unit helper	957.....	Scraper operator
	Bathhouse attendant	962.....	Car runner, surface
	Pointman		Trip rider
	Laborer		Brakeman
	Slate picker		Flagman
	Roustabout		Car rider
	Extra man		Conductor
624.....	Trainees	965.....	Dispatcher
	Apprentice	969.....	Swamper
663.....	Ledgeman		Motorman
	Quarry man		Switchman
	Miner, not elsewhere classified	985.....	Heavy equipment operator, surface
	Shaft miner		Mobile equipment operator, surface
	Probeman	996.....	Feeder man
710.....	Propman	997.....	General or many equipment operator
	Timberman	998.....	Janitor
716.....	Cement man		Bag stenciler
	Form man		Prospector
	Grizzly tender		Painter
728.....	Gizmo operator	1012...	Belt repairman
	Load-haul-dump operator, underground		Belt vulcanizer
749.....	Shift boss	1013...	Cleanup man
	Foreman-leadman	1014...	Sampler
	Bullgang foreman	1018...	Lube man
	Labor foreman		Greaser-oiler
	Section boss-foreman	1019...	Welder
768.....	Heavy equipment operator	1022...	Dump man
775.....	Grader operator, underground		Dump operator
776.....	Truck driver, underground	1055...	Chainman
778.....	Cherry picker	1056...	Rock driller
	Crane operator, underground	1060...	Machinist
	Dragline operator, underground		Shopman
	Backhoe operator, underground		Shop foreman
	Gradall operator		Bit sharpener
782	Front-end loader operator, underground		

APPENDIX B.—METALLIC MINING INDUSTRY EQUIPMENT OPERATED GROUPING

<i>Description</i>	<i>Equipment code</i>
Backhoe-crane-dragline-shovel	60, 14
Belt	13, 96
Dozer-heavy and mobile equipment	8, 85
Drill (underground)-rock bolter	53, 54, 49
Drill (surface)	9
Explosives	47
Front-end loader-forklift	24, 23
Grader-scraper	52, 57
Handtools (powered and nonpowered)	28
Hoist-elevator	30, 19, 38
Many equipment	97
Miscellaneous utility equipment	95, 12, 16
Plant equipment	40, 7, 10, 11, 15, 18, 22, 26, 32, 39, 46, 51, 58, 69, 82, 83
Pump	48
Scale-lab equipment-controls	92, 80, 91
Shuttle car-locomotive	61, 34, 33, 41, 42, 43, 65
Truck (haulage)	44, 45
Truck (utility)-personnel carrier	67, 37, 66
Welding machine-lathe	70, 5
None	0
Not elsewhere classified	98, 68, 71, 81, 88
Unspecified	99

<i>Code</i>	<i>Description</i>	<i>Code</i>	<i>Description</i>
0	None	15	Breaker
5	Drill press		Crusher
	Bench grinder	16	Cutting machines
	Lathe		Undercutter
7	Boats		Chain cutter
	Barges	18	Dredge
	Water transportation	19	Elevator
8	Bulldozer		Buckets
	Dozer		Cage
	Crawler tractor		Skip
9	Carriage mounted drill	22	Precipitator heavy media bath
	Jumbo drill		Filters
	Churn drill		Flotation machines
	Rotary drill	23	Forklift
	Jet piercing drill	24	Highlift
	Airtrack compressor drill		Skip tender
10	Chute		Front-end loader
	Airslide		Payloader
11	Classifier	26	Grizzlies
	Cyclones	28	Handtools (powered and nonpowered)
12	Continuous miner		Ram jack
	Dosco miner	30	Hoist
13	Belt feeder		Car dropper
	Mobile bridge carrier		Hydraulic jack
	Conveyor	32	Impactor
	All types belts	33	Scoop tram
14	Cherry picker		Unitrac
	Basket scaler		Load-haul-dump
	Scaling machine		Teletram car
	Rock or dropball		Bobcat, underground
	Boom hoist	34	Locomotive
	Derrick		Trammer
	Crane		Tow-motor
	Gantry		Lorry car
			Rail-mounted locomotive

<i>Code</i>	<i>Description</i>	<i>Code</i>	<i>Description</i>
37.....	Porta bus	54.....	Pinner
	Mancar		Roof bolting machine
	Golf cart	57.....	Pan scraper
	Mantrip		Scoop, surface
	Rail runner		Self-loading scraper
	Rail rover		Tractor scraper
	Personnel carrier		Scraper loader
	Boss buggy	58.....	Shaker
	Jeep		Vibrator
38.....	Man lift		Screen
	Scaling rig	60.....	Dragline
39.....	Grinding mills		Dragline bucket
	Ball or rod mills		Backhoe
40.....	Milling machinery		Power shovel
	Block press		Clamshell
	General plant equipment	61.....	Buggy
41.....	Nipper truck, underground		Shuttle car
	Mine car, underground		Ram car
	Underground flatcar	65.....	Track maintenance
	Timber truck, underground		Track repair equipment
42.....	Mine car, surface	66.....	Tractor, underground
	Ore-coal car, surface		Elkhorn
	Boxcar, surface		Supply car
	Hopper car, surface	67.....	Trash truck
43.....	Mucking machine		Service truck
	Overshot loader		Utility truck
44.....	Ore haulage trucks, offhighway		Water truck
45.....	Payloader ore haulage, onhighway		Dump truck
46.....	Bagger		Pickup truck
	Sewing machine	68.....	Tugger
	Packaging machine		Air winch
47.....	Pneumatic blast agent loader	69.....	Washers
	Pop shooter	70.....	Welding machine
	Driller loader		Torch
	Prill loader	71.....	Machines, not elsewhere classified
	Powder buggy		Rock rake
	Explosives		Drilling rigs
48.....	Pump		Impact roller
49.....	Raise borer	80.....	Lab equipment
51.....	Raw coal storage	81.....	Rigs, not elsewhere classified
	Tipple	82.....	Boilers
	Dump bins	83.....	Furnaces
52.....	Roadgrader		Calciners
	Motor grader		Kilns
	Motor patrol		Dryers
53.....	Jackleg	85.....	Heavy equipment
	Drifter drill		Mobile equipment
	Airleg	88.....	Diesels
	Diamond drill	91.....	Controls
	Track drill		Consoles
	Jumbo drill	92.....	Scales
	Rock drill	95.....	Miscellaneous utility equipment
	Buzzy drill	96.....	Feeders
	Jackhammer	97.....	Many-all types of equipment
	Hydraulic drill	98.....	Not elsewhere classified
	Stoper drill	99.....	Not specified

APPENDIX C.—ESTIMATION PROCEDURES

Establishment weight.—Suppose one out of every five mine establishments in a sampling stratum (industry-mine type-employment size class-status) was selected. Then, the sampling ratio is 1/5, and the establishment weight (EWT) is 5.00, the inverse of the sampling ratio.

Nonresponse adjustment factor.—Also suppose in a given sampling stratum, 80 pct of the establishments that were within the scope of the survey responded. Then, the nonresponse adjustment factor (NRAF) is 1.25 (i.e., 100/80).

Worker weight.—Additionally, there was the sampling ratio with which the workers in the establishment were sampled; the worker weight (WWT) ranged from 1.00 to 30.00 (see the first page of the MIPS questionnaire in appendix F). Theoretically, all the workers in a sampling stratum should have had the same weight. Hence, there would have been no need to assign weight at the worker level, as the worker weight could have been incorporated into the establishment weight. In practice, however, this is seldom the case because for a few establishments the employment level changes from what it was on the sampling frame to the time of the survey data collection. Since all the establishments did not report in the same employment size class that they were sampled in, it was necessary to also assign each worker a weight.

Final weight.—For the purpose of computing the estimates, each worker was assigned a final weight (FWT) which was the product of establishment weight (EWT), nonresponse adjustment factor (NRAF), and the worker weight (WWT). That is, $FWT = EWT \times NRAF \times WWT$.

Estimates of number of workers.—The estimates of the total number of workers were computed by (1) summing the final weights over the appropriate domain, and (2) rounding the sum to the nearest integer.

Example: To estimate the total number of truck drivers:

1. Compute $x = \sum_{i \in D} FWT_i$.

Where the domain, D, was the set of all records (workers) that had an occupation code of truck driver.

2. Compute $y = \text{round}(x)$.

Estimates of mean.—The estimates of mean age (training) were computed by summing over the appropriate domain (1) the product of age (training) and final weight, (2) the final weights, and then (3) dividing the sum of the products by the sum of the weights and rounding the result to the nearest whole number. It should be noted that for each domain only those entries where age (training) was specified were included in the computation.

Example: To estimate the mean age of the truck drivers:

1. Compute $x = \sum_{i \in D} (\text{Age}_i * FWT_i)$.

2. Compute $y = \sum_{i \in D} FWT_i$.

Where domain, D, is the set of all records that had an occupation code of truck driver with age being specified.

3. Compute $z = \text{round}(x/y)$.

Estimates of median.—The estimates of median job, company, and mining experience were derived by (1) sorting over the domain the records in ascending order of the experience for which the median statistic was desired, (2) computing the total number of workers (NW) in the domain by summing the final weights, and (3) selecting the experience corresponding to the middle worker(s) in the ordering. That is, if NW is an odd number, then the median experience is the experience corresponding to the $(NW/2 + 1)$ th worker in the ordering; if NW is an even number, then the median experience is the midpoint (rounded to the nearest integer) of the experience corresponding to the $(NW/2)$ th and $(NW/2 + 1)$ th worker in the ordering. As with the mean estimates, the median estimates also excluded those entries in the domain with unspecified experience.

APPENDIX D.—RELIABILITY OF ESTIMATES: RANDOM GROUP VARIANCE TECHNIQUE

The random group method of variance estimation employed in this study consisted of selecting eight samples using the same sampling scheme for each sample as the parent sample. The primary sampling units (establishments) were divided into two sets. The first set consisted of noncertainty (probability of selection less than 1.00) primary sampling units sorted by their original industry-mine type-employment size class-status. A random integer, say j , between 1 and 8 was generated. The first primary unit in the ordering was assigned to the random group j , the second to the random group $j + 1$, and so forth in a modulo 8 fashion. Then, the secondary sampling units (workers) were assigned the same random group number as the primary unit to which they belonged. The second set consisted of all secondary sampling units belonging to the certainty (probability of selection equal to 1.00) primary sampling units. The secondary sampling units were sorted by the same scheme as above, and a random integer, say k , between 1 and 8 was generated. Then, the first secondary unit in the ordering was assigned to the random group k , the second to the random group $k + 1$, and so forth in a modulo 8 fashion. Hence, each worker belonged to a random group. For a more detailed discussion of the random group technique, the reader is referred to reference 9 of the main text.

The following procedure was followed in computing the estimated variance (var), standard error (s), and the coefficient of

variation (CV) for the estimated number of workers belonging to a particular category.

1. The domain (i.e., category) was defined.
2. A separate estimate for total number of workers, $\hat{\theta}_i$, for each of the eight random groups was computed. If any random group was empty, then a zero was assigned to that random group.
3. Total number of workers, $\hat{\theta}$, for all eight groups was computed as

$$\hat{\theta} = \hat{\theta}_1 + \hat{\theta}_2 + \dots + \hat{\theta}_8.$$

4. The mean number of workers per group was computed as $\hat{\bar{\theta}} = \hat{\theta}/8$.

5. The variance for $\hat{\theta}$ was computed as

$$\text{var}(\hat{\theta}) = 8 \sum_{i=1}^8 \frac{(\hat{\theta}_i - \hat{\bar{\theta}})^2}{7}.$$

6. The standard error of $\hat{\theta}$ was computed as

$$s(\hat{\theta}) = \sqrt{\text{var}(\hat{\theta})}.$$

7. The CV for $\hat{\theta}$ was computed as

$$CV(\hat{\theta}) = \frac{s(\hat{\theta})}{\hat{\theta}} \times 100.0.$$

APPENDIX E.—METALLIC MINING 1986 WORKFORCE ESTIMATES

Table E-1.—Metallic mining 1986 workforce estimates: job title, by employment size class¹

Job title grouping ²	1-19		20-49		50-99		100-249		250-499		500+		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Backhoe-crane-dragline-shovel operator...	38	2	15	1	18	1	63	1	103	2	320	2	557	2
Beltman-belt repairman	0	0	0	0	0	0	0	0	40	1	87	1	127	0
Blaster	0	0	0	0	0	0	46	1	93	2	50	0	189	1
Deckhand-barge and dredge operator ...	6	0	0	0	0	0	7	0	0	0	0	0	12	0
Dozer-heavy and mobile equipment operator	81	5	79	5	30	1	148	2	299	5	403	2	1,040	3
Driller-rock bolter	85	5	54	3	72	3	300	4	163	3	355	2	1,029	3
Electrician-lampman	47	3	17	1	70	3	197	3	208	4	1,125	7	1,663	5
Front-end loader-forklift operator	117	7	41	2	84	4	167	2	105	2	115	1	629	2
Grader-scraper operator	0	0	24	1	0	0	74	1	28	0	70	0	195	1
Laborer-miner-utility man	256	14	190	11	380	18	956	12	396	7	2,106	12	4,284	12
Manager-foreman-supervisor:														
General	231	13	134	8	134	6	478	6	156	3	424	2	1,558	4
Maintenance	27	2	32	2	24	1	135	2	137	2	182	1	537	1
Working	37	2	135	8	102	5	394	5	247	4	960	6	1,874	5
Mechanic-welder-oiler-machinist	220	12	224	13	416	20	1,342	17	1,344	24	4,311	25	7,857	22
Mine technical support	252	14	183	11	267	13	1,108	14	521	9	1,745	10	4,076	11
Office worker	118	7	123	7	118	6	548	7	246	4	733	4	1,886	5
Plant operator-warehouseman	158	9	352	21	243	12	1,045	14	842	15	2,635	15	5,275	15
Shuttle car-tram operator	32	2	0	0	23	1	225	3	41	1	647	4	968	3
Truck driver	68	4	92	5	122	6	483	6	620	11	800	5	2,184	6
Total	1,771	100	1,695	100	2,101	100	7,715	100	5,590	100	17,068	100	35,940	100

¹MSHA size groups are based on the annual average employment of the primary subunit and not on the total employment; hence, MSHA published injury statistics by size groups should not be analyzed against these data.

²As defined by MSHA; see appendix A for detailed explanation of job title grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-2.—Metallic mining 1986 workforce estimates:¹ principal equipment operated, by employment size class²

Job title grouping ²	1-19		20-49		50-99		100-249		250-499		500+		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Backhoe-crane-dragline-shovel	44	3	33	2	21	1	54	1	103	2	395	2	650	2
Belt	0	0	0	0	0	0	0	0	40	1	87	1	127	0
Dozer-heavy and mobile equipment	83	5	89	6	33	2	135	2	251	5	370	2	961	3
Drill (underground)-rock bolter	39	2	38	2	47	2	215	3	80	1	405	2	823	2
Drill (surface)	47	3	17	1	21	1	103	1	83	2	58	0	328	1
Explosives	0	0	0	0	0	0	46	1	79	1	50	0	175	1
Front-end loader-forklift	135	8	83	5	122	6	194	3	257	5	212	1	1,003	3
Grader-scraper	0	0	24	2	0	0	74	1	28	1	70	0	195	1
Handtools (powered and nonpowered) ...	190	11	220	14	337	17	1,454	20	1,315	25	4,372	27	7,888	23
Hoist-elevator	35	2	0	0	41	2	120	2	0	0	25	0	221	1
Many equipment	146	9	37	2	173	9	78	1	48	1	84	1	567	2
Miscellaneous utility equipment	74	4	145	9	93	5	628	9	185	3	1,247	8	2,371	7
Plant equipment	172	10	274	17	216	11	893	12	623	12	1,857	11	4,036	12
Pump	6	0	54	3	57	3	23	0	0	0	55	0	195	1
Scale-lab equipment-controls	53	3	92	6	114	6	410	6	186	3	919	6	1,772	5
Shuttle car-locomotive	32	2	0	0	8	0	191	3	41	1	779	5	1,050	3
Truck (haulage)	78	5	97	6	135	7	498	7	634	12	858	5	2,299	7
Truck (utility)-personnel carrier	48	3	22	1	25	1	111	2	146	3	727	4	1,080	3
Welding machine-lathe	77	5	24	2	89	4	174	2	237	4	1,031	6	1,632	5
None	355	21	309	20	362	18	1,704	24	997	19	2,485	15	6,212	18
Not elsewhere classified	42	3	13	1	83	4	6	0	10	0	140	1	294	1
Unspecified	0	0	0	0	9	0	57	1	0	0	108	1	174	1
Total	1,653	100	1,571	100	1,983	100	7,168	100	5,343	100	16,335	100	34,054	100

¹Excluding job title category of office workers.

²MSHA size groups are based on the annual average employment of the primary subunit and not on the total employment; hence, MSHA published injury statistics by size groups should not be analyzed against these data.

³See appendix B for detailed explanation of equipment operated grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-3.—Metallic mining 1986 workforce estimates: work location at mine, by employment size class¹

Work location	1-19		20-49		50-99		100-249		250-499		500+		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Underground mine	397	22	102	6	582	28	1,801	23	320	6	1,778	10	4,980	14
Surface at underground mine	291	16	11	1	68	3	523	7	144	3	719	4	1,756	5
Surface mine	568	32	482	28	525	25	1,873	24	2,974	53	4,570	27	10,992	31
Plant or mill	361	20	902	53	780	37	2,593	34	1,703	30	8,787	51	15,126	42
Office	154	9	198	12	147	7	926	12	449	8	1,213	7	3,087	9
Total	1,771	100	1,695	100	2,101	100	7,715	100	5,590	100	17,068	100	35,940	100

¹MSHA size groups are based on the annual average employment of the primary subunit and not on the total employment; hence, MSHA published injury statistics by size groups should not be analyzed against these data.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-4.—Metallic mining 1986 workforce estimates:¹ experience at job, company, and mining, by employment size class²

Experience, yr	1-19		20-49		50-99		100-249		250-499		500+		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
At present job:														
0< to <=1	599	36	656	42	564	28	1,984	28	1,043	20	1,770	11	6,616	19
1< to <=2	225	14	188	12	248	13	883	12	577	11	1,543	9	3,665	11
2< to <=3	199	12	121	8	296	15	742	10	394	7	1,013	6	2,764	8
3< to <=5	162	10	111	7	222	11	1,028	14	415	8	1,411	9	3,349	10
5< to <=10	202	12	212	14	283	14	1,627	23	1,531	29	4,368	27	8,223	24
10< to <=20	148	9	115	7	204	10	841	12	583	11	4,601	28	6,492	19
20<	50	3	47	3	26	1	63	1	401	8	1,530	9	2,117	6
Unspecified	68	4	120	8	141	7	0	0	400	7	100	1	828	2
Total	1,653	100	1,571	100	1,983	100	7,168	100	5,343	100	16,335	100	34,054	100
Median	2	NAP	2	NAP	3	NAP	3	NAP	6	NAP	8	NAP	6	NAP
At present company:														
0< to <=1	503	30	568	36	333	17	1,137	16	436	8	1,334	8	4,312	13
1< to <=5	664	40	558	36	587	30	1,960	27	1,430	27	717	4	5,915	17
5< to <=10	160	10	285	18	396	20	2,117	30	1,364	26	3,391	21	7,713	23
10< to <=15	59	4	70	4	269	14	670	9	716	13	3,783	23	5,568	16
15< to <=20	70	4	37	2	164	8	837	12	406	8	3,550	22	5,064	15
20< to <=25	13	1	15	1	109	6	254	4	412	8	1,385	8	2,188	6
25< to <=30	22	1	24	2	37	2	102	1	235	4	1,062	7	1,482	4
30<	25	1	4	0	75	4	90	1	345	6	1,013	6	1,552	5
Unspecified	137	8	10	1	12	1	0	0	0	0	100	1	260	1
Total	1,653	100	1,571	100	1,983	100	7,168	100	5,343	100	16,335	100	34,054	100
Median	2	NAP	3	NAP	6	NAP	6	NAP	9	NAP	13	NAP	10	NAP
Total mining:														
0< to <=1	264	16	278	18	128	6	596	8	181	3	77	0	1,524	4
1< to <=5	276	17	362	23	424	21	1,395	19	743	14	630	4	3,830	11
5< to <=10	279	17	304	19	422	21	2,021	28	1,115	21	2,999	18	7,141	21
10< to <=15	160	10	178	11	323	16	903	13	675	13	4,175	26	6,413	19
15< to <=20	177	11	82	5	251	13	1,017	14	368	7	3,856	24	5,751	17
20< to <=25	89	5	78	5	115	6	476	7	328	6	1,654	10	2,740	8
25< to <=30	69	4	50	3	84	4	149	2	305	6	1,083	7	1,740	5
30<	135	8	28	2	89	4	162	2	385	7	1,085	7	1,883	6
Unspecified	204	12	212	14	149	8	448	6	1,243	23	775	5	3,032	9
Total	1,653	100	1,571	100	1,983	100	7,168	100	5,343	100	16,335	100	34,054	100
Median	9	NAP	6	NAP	10	NAP	9	NAP	11	NAP	15	NAP	12	NAP

NAP Not applicable.

¹Excluding job title category of office workers.

²MSHA size groups are based on the annual average employment of the primary subunit and not on the total employment; hence, MSHA published injury statistics by size groups should not be analyzed against these data.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-5.—Metallic mining 1986 workforce estimates:¹ training received, by employment size class²

Job training for last 2 yr, h	1-19		20-49		50-99		100-249		250-499		500+		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
0	156	9	17	1	28	1	481	7	97	2	889	5	1,667	5
1-8	227	14	23	1	105	5	358	5	179	3	335	2	1,227	4
9-15	57	3	0	0	66	3	86	1	41	1	881	5	1,132	3
16	325	20	338	22	764	39	1,322	18	345	6	1,951	12	5,046	15
17-40	355	21	473	30	475	24	1,862	26	1,504	28	6,866	42	11,535	34
41-80	185	11	383	24	223	11	644	9	386	7	870	5	2,691	8
81-160	138	8	32	2	108	5	135	2	234	4	277	2	924	3
161+	91	5	11	1	15	1	261	4	357	7	1,300	8	2,035	6
Unspecified	120	7	295	19	198	10	2,019	28	2,200	41	2,966	18	7,798	23
Total	1,653	100	1,571	100	1,983	100	7,168	100	5,343	100	16,335	100	34,054	100
Mean job training	42	Nap	42	Nap	35	Nap	34	Nap	73	Nap	41	Nap	43	Nap

Nap Not applicable.

¹Excluding job title category of office workers.²MSHA size groups are based on the annual average employment of the primary subunit and not on the total employment; hence, MSHA published injury statistics by size groups should not be analyzed against these data.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-6.—Metallic mining 1986 workforce estimates:¹ age distribution, by employment size class²

Age, yr	1 to 19		20 to 49		50 to 99		100 to 249		250 to 499		500+		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
15-20	58	4	31	2	35	2	97	1	46	1	50	0	317	1
21-23	105	6	77	5	28	1	305	4	170	3	25	0	711	2
24-26	141	9	142	9	106	5	591	8	249	5	205	1	1,433	4
27-29	147	9	96	6	149	8	718	10	491	9	909	6	2,511	7
30-34	197	12	356	23	388	20	1,192	17	1,081	20	2,350	14	5,564	16
35-39	190	11	228	15	284	14	1,138	16	930	17	3,401	21	6,171	18
40-49	336	20	387	25	491	25	1,841	26	1,204	23	5,299	32	9,559	28
50+	448	27	245	16	414	21	1,107	15	1,172	22	4,096	25	7,482	22
Unspecified	31	2	10	1	88	4	179	2	0	0	0	0	308	1
Total	1,653	100	1,571	100	1,983	100	7,168	100	5,343	100	16,335	100	34,054	100
Mean age	40	Nap	38	Nap	40	Nap	38	Nap	40	Nap	42	Nap	41	Nap

Nap Not applicable.

¹Excluding job title category of office workers.²MSHA size groups are based on the annual average employment of the primary subunit and not on the total employment; hence, MSHA published injury statistics by size groups should not be analyzed against these data.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-7.—Metallic mining 1986 workforce estimates:¹ sex, race, and education, by employment size class²

	1-19		20-49		50-99		100-249		250-499		500+		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Sex:														
Male	1,508	91	1,499	95	1,921	97	6,841	95	5,115	96	15,853	97	32,735	96
Female	70	4	68	4	62	3	296	4	229	4	457	3	1,182	3
Unspecified	75	5	5	0	0	0	31	0	0	0	25	0	136	0
Total	1,653	100	1,571	100	1,983	100	7,168	100	5,343	100	16,335	100	34,054	100
Race:														
White	1,468	89	1,077	69	1,798	91	5,819	81	4,717	88	13,919	85	28,798	85
Black	6	0	200	13	30	1	42	1	106	2	410	3	793	2
Hispanic	105	6	162	10	124	6	993	14	357	7	1,729	11	3,469	10
Other	70	4	20	1	12	1	194	3	148	3	227	1	671	2
Unspecified	6	0	112	7	20	1	120	2	16	0	50	0	324	1
Total	1,653	100	1,571	100	1,983	100	7,168	100	5,343	100	16,335	100	34,054	100
Education level:														
Some elementary	68	4	24	2	150	8	367	5	176	3	898	5	1,682	5
Some high school	172	10	163	10	197	10	824	12	509	10	1,784	11	3,650	11
High school diploma	705	43	580	37	870	44	3,088	43	2,556	48	7,935	49	15,733	46
Vocational diploma	150	9	166	11	190	10	830	12	601	11	1,305	8	3,243	10
Some college	261	16	231	15	257	13	1,145	16	935	18	2,596	16	5,425	16
College degree	241	15	190	12	200	10	837	12	538	10	1,072	7	3,079	9
Unspecified	56	3	217	14	119	6	77	1	28	1	745	5	1,242	4
Total	1,653	100	1,571	100	1,983	100	7,168	100	5,343	100	16,335	100	34,054	100

¹Excluding job title category of office workers.²MSHA size groups are based on the annual average employment of the primary subunit and not on the total employment; hence, MSHA published injury statistics by size groups should not be analyzed against these data.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-8.—Metallic mining 1986 workforce estimates: job title, by principal equipment operated¹, number of workers

Job title grouping ²	Backhoe crane dragline shovel	Belt	Dozer heavy and mobile equip- ment	Drill (under- ground) rock bolter	Drill (surface)	Explo- sives	Front-end loader forklift	Grader scraper	Handtools (powered and non- powered)
Backhoe-crane-dragline-shovel operator	528	0	0	0	0	0	0	0	0
Beltman-belt repairman	0	127	0	0	0	0	0	0	0
Blaster	0	0	0	0	0	175	0	0	0
Deckhand-barge and dredge operator	0	0	0	0	0	0	7	0	0
Dozer-heavy and mobile equipment operator	8	0	920	0	0	0	39	0	0
Driller-rock bolter	7	0	0	684	314	0	0	0	16
Electrician-lampman	0	0	0	0	0	0	0	0	1,663
Front-end loader-forklift operator	0	0	0	0	0	0	629	0	0
Grader-scraper operator	0	0	0	0	0	0	0	195	0
Laborer-miner-utility man	11	0	6	111	0	0	104	0	58
Manager-foreman-supervisor:									
General	6	0	6	0	0	0	14	0	0
Maintenance	0	0	0	0	0	0	0	0	4
Working	9	0	16	3	0	0	0	0	28
Mechanic-welder-oiler-machinist	75	0	0	0	14	0	0	0	6,044
Mine technical support	0	0	0	0	0	0	0	0	25
Office worker	0	0	0	0	0	0	0	0	0
Plant operator-warehouseman	7	0	14	25	0	0	210	0	50
Shuttle car-tram operator	0	0	0	0	0	0	0	0	0
Truck driver	0	0	0	0	0	0	0	0	0
Total	650	127	961	823	328	175	1,003	195	7,888
	Hoist elevator	Many equip- ment	Miscel- laneous utility equip- ment	Plant equip- ment	Pump	Scale-lab equip- ment controls	Shuttle car loco- motive	Stone cutting finishing machine	Truck (haulage)
Backhoe-crane-dragline-shovel operator	0	0	0	0	0	0	0	0	0
Beltman-belt repairman	0	0	0	0	0	0	0	0	0
Blaster	0	0	0	0	0	0	0	0	0
Deckhand-barge and dredge operator	0	0	0	6	0	0	0	0	0
Dozer-heavy and mobile equipment operator	0	16	0	0	0	0	0	57	0
Driller-rock bolter	8	0	0	0	0	0	0	0	0
Electrician-lampman	0	0	0	0	0	0	0	0	0
Front-end loader-forklift operator	0	0	0	0	0	0	0	0	0
Grader-scraper operator	0	0	0	0	0	0	0	0	0
Laborer-miner-utility man	42	475	2,371	35	75	0	164	31	451
Manager-foreman-supervisor:									
General	0	54	0	23	0	71	0	7	52
Maintenance	0	0	0	0	0	0	0	0	35
Working	0	22	0	21	0	0	0	8	281
Mechanic-welder-oiler-machinist	0	0	0	40	0	0	0	0	0
Mine technical support	147	0	0	40	6	1,552	25	12	220
Office worker	0	0	0	0	0	0	0	0	0
Plant operator-warehouseman	25	0	0	3,747	114	149	50	0	41
Shuttle car-tram operator	0	0	0	123	0	0	811	0	0
Truck driver	0	0	0	0	0	0	0	2,184	0
Total	221	567	2,371	4,036	195	1,772	1,050	2,299	1,080

See explanatory notes at end of table.

Table E-8.—Metallic mining 1986 workforce estimates: job title, by principal equipment operated,¹ number of workers—Con.

Job title grouping ²	Welding machine lathe	None	Not elsewhere classified	Unspecified	Total
Backhoe-crane-dragline-shovel operator	0	29	0	0	557
Beltman-belt repairman	0	0	0	0	127
Blaster	0	14	0	0	189
Deckhand-barge and dredge operator	0	0	0	0	12
Dozer-heavy and mobile equipment operator	0	0	0	0	1,040
Driller-rock bolter	0	0	0	0	1,029
Electrician-lampman	0	0	0	0	1,663
Front-end loader-forklift operator	0	0	0	0	629
Grader-scraper operator	0	0	0	0	195
Laborer-miner-utility man	0	155	134	61	4,284
Manager-foreman-supervisor:					
General	0	1,325	0	0	1,558
Maintenance	0	498	0	0	537
Working	0	1,486	0	0	1,874
Mechanic-welder-oiler-machinist	1,632	0	53	0	7,857
Mine technical support	0	1,988	15	47	4,076
Office worker	0	1,886	0	0	1,886
Plant operator-warehouseman	0	684	92	67	5,275
Shuttle car-tram operator	0	33	0	0	968
Truck driver	0	0	0	0	2,184
Total	1,632	8,098	294	174	35,940

¹See appendix B for detailed explanation of equipment operated grouping.²As defined by MSHA; see appendix A for detailed explanation of job title grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-9.—Metallic mining 1986 workforce estimates: job title, by work location at mine, number of workers

Job title grouping ¹	Underground mine	Surface at underground mine	Surface mine	Plant or mill	Office	Total
Backhoe-crane-dragline-shovel operator	0	0	440	117	0	557
Beltman-belt repairman	0	32	0	95	0	127
Blaster	39	0	150	0	0	189
Deckhand-barge and dredge operator	0	7	6	0	0	12
Dozer-heavy and mobile equipment operator	32	107	704	196	0	1,040
Driller-rock bolter	791	20	210	9	0	1,029
Electrician-lampman	92	133	439	999	0	1,663
Front-end loader-forklift operator	102	13	291	223	0	629
Grader-scraper operator	27	0	168	0	0	195
Laborer-miner-utility man	1,414	124	1,362	1,384	0	4,284
Manager-foreman-supervisor:						
General	297	66	529	538	128	1,558
Maintenance	36	69	104	309	19	537
Working	276	26	672	895	6	1,874
Mechanic-welder-oiler-machinist	580	551	2,970	3,756	0	7,857
Mine technical support	278	460	719	1,747	873	4,076
Office worker	0	0	0	0	1,886	1,886
Plant operator-warehouseman	91	92	271	4,646	175	5,275
Shuttle car-tram operator	806	0	71	90	0	968
Truck driver	120	58	1,885	122	0	2,184
Total	4,980	1,756	10,992	15,126	3,087	35,940

¹As defined by MSHA; see appendix A for detailed explanation of job title grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-10.—Metallic mining 1986 workforce estimates: job title, by years of experience at job

Job title grouping ¹	0< to ≤1	1< to ≤2	2< to ≤3	3< to ≤5	5< to ≤10	10< to ≤20	20<	Unspeci- fied	Total	Median, yr
Backhoe-crane-dragline-shovel operator	74	26	63	15	156	163	55	6	557	9
Beltman-belt repairman	72	0	0	0	25	30	0	0	127	1
Blaster	41	61	6	25	33	23	0	0	189	2
Deckhand-barge and dredge operator	0	0	6	0	7	0	0	0	12	8
Dozer-heavy and mobile equipment operator	232	45	134	95	235	128	101	69	1,040	5
Driller-rock bolter	185	148	72	202	201	163	10	48	1,029	5
Electrician-lampman	169	40	56	81	563	686	61	6	1,663	10
Front-end loader-forklift operator	115	87	45	71	205	94	1	11	629	5
Grader-scraper operator	18	30	10	6	94	38	0	0	195	7
Laborer-miner-utility man	1,390	553	473	328	773	645	65	58	4,284	3
Manager-foreman-supervisor:										
General	352	152	160	253	318	91	124	109	1,558	4
Maintenance	38	31	69	48	208	98	2	44	537	7
Working	237	130	172	230	715	243	84	63	1,874	6
Mechanic-welder-oiler-machinist	862	643	419	612	1,883	2,385	914	137	7,857	9
Mine technical support	815	617	377	510	1,066	396	243	53	4,076	4
Office worker	356	227	185	253	459	285	60	62	1,886	5
Plant operator-warehouseman	1,429	596	412	603	967	904	267	98	5,275	4
Shuttle car-tram operator	156	179	63	122	345	62	41	0	968	5
Truck driver	431	327	230	149	429	344	149	126	2,184	4
Total	6,972	3,892	2,948	3,602	8,682	6,777	2,177	891	35,940	6

¹As defined by MSHA; see appendix A for detailed explanation of job title grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-11.—Metallic mining 1986 workforce estimates: job title, by years of experience at company

Job title grouping ¹	0< to ≤1	1< to ≤5	5< to ≤10	10< to ≤15	15< to ≤20	20< to ≤25	25< to ≤30	30<	Unspeci- fied	Total	Median, yr
Backhoe-crane-dragline-shovel operator	51	41	84	166	72	60	30	53	0	557	12
Beltman-belt repairman	32	0	40	25	30	0	0	0	0	127	10
Blaster	16	39	28	38	6	49	0	14	0	189	13
Deckhand-barge and dredge operator	0	6	0	0	7	0	0	0	0	12	18
Dozer-heavy and mobile equipment operator	106	223	181	139	187	111	30	50	12	1,040	11
Driller-rock bolter	168	260	268	156	116	20	14	21	8	1,029	6
Electrician-lampman	81	130	420	411	337	134	121	24	6	1,663	12
Front-end loader-forklift operator	80	177	123	100	119	22	8	0	0	629	6
Grader-scraper operator	18	19	37	77	7	0	18	20	0	195	13
Laborer-miner-utility man	917	670	991	862	412	159	161	90	21	4,284	8
Manager-foreman-supervisor:											
General	170	441	398	148	132	121	55	24	70	1,558	6
Maintenance	39	117	172	40	85	38	15	0	30	537	9
Working	125	185	467	251	307	190	129	197	25	1,874	12
Mechanic-welder-oiler-machinist	638	1,075	1,661	1,321	1,526	593	441	577	25	7,857	12
Mine technical support	561	813	970	736	455	235	164	102	39	4,076	8
Office worker	289	336	551	363	179	67	31	59	12	1,886	8
Plant operator-warehouseman	739	1,110	1,156	747	779	268	207	251	18	5,275	9
Shuttle car-tram operator	211	102	343	100	67	67	44	34	0	968	8
Truck driver	361	506	376	251	421	122	45	96	6	2,184	7
Total	4,601	6,251	8,264	5,931	5,244	2,255	1,513	1,610	272	35,940	10

¹As defined by MSHA; see appendix A for detailed explanation of job title grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-12.—Metallic mining 1986 workforce estimates: job title, by years of mining experience

Job title grouping ¹	0< to ≤1	1< to ≤5	5< to ≤10	10< to ≤15	15< to ≤20	20< to ≤25	25< to ≤30	30<	Unspeci- fied	Total	Median, yr
Backhoe-crane-dragline-shovel operator	37	20	58	183	72	60	30	58	39	557	13
Beltman-belt repairman	0	0	40	25	62	0	0	0	0	127	13
Blaster	16	28	20	38	14	24	0	14	37	189	13
Deckhand-barge and dredge operator	0	0	0	0	7	0	0	0	6	12	18
Dozer-heavy and mobile equipment operator	98	121	203	120	174	97	36	50	140	1,040	12
Driller-rock bolter	22	146	224	224	250	26	28	24	86	1,029	12
Electrician-lampman	45	113	392	414	331	117	93	78	81	1,663	13
Front-end loader-forklift operator	34	105	133	111	140	35	8	11	51	629	11
Grader-scraper operator	0	21	37	87	7	0	18	20	6	195	13
Laborer-miner-utility man	374	477	1,050	1,018	532	318	208	147	161	4,284	11
Manager-foreman-supervisor:											
General	45	188	334	276	204	177	87	79	169	1,558	12
Maintenance	0	40	138	44	102	43	69	20	81	537	16
Working	10	73	282	293	382	225	113	196	300	1,874	18
Mechanic-welder-oiler-machinist	197	822	1,541	1,320	1,644	678	448	577	631	7,857	14
Mine technical support	233	460	866	834	484	267	210	223	500	4,076	12
Office worker	133	214	535	274	227	147	45	77	232	1,886	10
Plant operator-warehouseman	284	775	1,166	923	868	411	299	241	309	5,275	12
Shuttle car-tram operator	6	84	327	271	80	115	51	34	0	968	11
Truck driver	123	359	331	233	399	147	45	111	437	2,184	12
Total	1,658	4,045	7,676	6,687	5,978	2,887	1,785	1,960	3,264	35,940	12

¹As defined by MSHA; see appendix A for detailed explanation of job title grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-13.—Metallic mining 1986 workforce estimates: job title, by hours of training received in last 2 years

Job title grouping ¹	0	1-8	9-15	16	17-40	41-80	81-160	161+	Unspeci- fied	Total	Mean, hr
Backhoe-crane-dragline-shovel operator	27	26	0	62	126	11	0	106	200	557	66
Beltman-belt repairman	0	0	32	0	55	0	0	0	40	127	20
Blaster	25	0	0	8	53	44	0	0	59	189	29
Deckhand-barge and dredge operator	0	0	0	7	0	0	6	0	0	12	63
Dozer-heavy and mobile equipment operator	31	17	25	132	390	74	10	100	260	1,040	57
Driller-rock bolter	103	6	0	270	76	165	22	95	292	1,029	68
Electrician-lampman	95	59	0	356	487	112	0	183	371	1,663	48
Front-end loader-forklift operator	12	24	34	105	202	49	0	12	191	629	30
Grader-scraper operator	0	29	0	82	21	6	3	0	54	195	20
Laborer-miner-utility man	158	173	203	805	1,293	363	150	145	994	4,284	37
Manager-foreman-supervisor:											
General	84	107	124	276	397	85	97	55	332	1,558	37
Maintenance	45	44	0	45	141	83	12	0	167	537	29
Working	98	176	0	188	492	242	164	182	332	1,874	54
Mechanic-welder-oiler-machinist	465	154	176	1,190	3,258	396	160	532	1,527	7,857	46
Mine technical support	205	245	157	535	1,249	296	143	100	1,146	4,076	33
Office worker	340	115	63	180	256	97	60	35	739	1,886	32
Plant operator-warehouseman	153	96	347	440	2,337	400	126	397	980	5,275	45
Shuttle car-tram operator	8	19	0	333	196	240	0	14	157	968	34
Truck driver	158	52	34	212	762	125	32	113	696	2,184	41
Total	2,007	1,342	1,195	5,226	11,792	2,788	984	2,070	8,537	35,940	43

¹As defined by MSHA; see appendix A for detailed explanation of job title grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-14.—Metallic mining 1986 workforce estimates: job title, by years of age

Job title grouping ¹	15-20	21-23	24-26	27-29	30-34	35-39	40-49	50+	Unspeci- fied	Total	Mean, yr
Backhoe-crane-dragline-shovel operator	0	0	6	37	100	89	164	157	4	557	43
Beltman-belt repairman	0	0	0	20	0	45	62	0	0	127	39
Blaster	0	16	0	8	45	14	52	55	0	189	42
Deckhand-barge and dredge operator	0	0	0	0	6	0	7	0	0	12	39
Dozer-heavy and mobile equipment operator	0	5	50	80	158	281	279	177	10	1,040	41
Driller-rock bolter	26	0	41	83	176	317	250	136	0	1,029	38
Electrician-lampman	0	27	10	36	312	359	430	478	12	1,663	43
Front-end loader-forklift operator	7	19	38	48	94	67	179	164	11	629	41
Grader-scraper operator	0	3	9	20	56	19	72	18	0	195	39
Laborer-miner-utility man	134	162	235	410	880	772	970	676	45	4,284	38
Manager-foreman-supervisor:											
General	0	6	67	66	268	349	350	409	42	1,558	42
Maintenance	0	0	0	8	57	71	221	179	0	537	45
Working	0	9	6	100	285	325	537	605	7	1,874	44
Mechanic-welder-oiler-machinist	25	91	274	498	1,084	1,503	2,533	1,814	35	7,857	42
Mine technical support	27	124	175	435	726	632	1,088	835	33	4,076	40
Office worker	14	38	36	97	247	461	607	369	18	1,886	41
Plant operator-warehouseman	60	184	295	352	955	787	1,457	1,162	23	5,275	40
Shuttle car-tram operator	0	0	81	148	82	218	267	170	0	968	39
Truck driver	38	65	145	161	282	322	639	448	85	2,184	40
Total	330	749	1,468	2,608	5,811	6,632	10,165	7,851	325	35,940	41

¹As defined by MSHA; see appendix A for detailed explanation of job title grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-15.—Metallic mining 1986 workforce estimates: job title, by sex

Job title grouping ¹	Male		Female		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Backhoe-crane-dragline-shovel operator	522	2	30	1	5	4	557	2
Beltman-belt repairman	127	0	0	0	0	0	127	0
Blaster	164	0	26	1	0	0	189	1
Deckhand-barge and dredge operator	12	0	0	0	0	0	12	0
Dozer-heavy and mobile equipment operator	1,028	3	0	0	12	9	1,040	3
Driller-rock bolter	1,029	3	0	0	0	0	1,029	3
Electrician-lampman	1,657	5	0	0	6	4	1,663	5
Front-end loader-forklift operator	573	2	45	2	11	8	629	2
Grader-scraper operator	195	1	0	0	0	0	195	1
Laborer-miner-utility man	4,084	12	194	9	6	4	4,284	12
Manager-foreman-supervisor:								
General	1,443	4	94	4	21	15	1,558	4
Maintenance	537	2	0	0	0	0	537	1
Working	1,849	6	0	0	25	18	1,874	5
Mechanic-welder-oiler-machinist	7,818	23	20	1	19	13	7,857	22
Mine technical support	3,549	11	503	22	24	17	4,076	11
Office worker	807	2	1,073	48	6	4	1,886	5
Plant operator-warehouseman	5,043	15	226	10	6	4	5,275	15
Shuttle car-tram operator	968	3	0	0	0	0	968	3
Truck driver	2,139	6	45	2	0	0	2,184	6
Total	33,542	100	2,255	100	143	100	35,940	100

¹As defined by MSHA; see appendix A for detailed explanation of job title grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-16.—Metallic mining 1986 workforce estimates: job title, by race

Job title grouping ¹	White		Black		Hispanic		Other		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Backhoe-crane-dragline-shovel operator	514	2	0	0	43	1	0	0	0	0	557	2
Beltman-belt repairman	102	0	25	3	0	0	0	0	0	0	127	0
Blaster	119	0	0	0	25	1	45	6	0	0	189	1
Deckhand-barge and dredge operator	12	0	0	0	0	0	0	0	0	0	12	0
Dozer-heavy and mobile equipment operator	871	3	20	2	94	3	45	6	10	3	1,040	3
Driller-rock bolter	857	3	0	0	119	3	53	7	0	0	1,029	3
Electrician-lampman	1,457	5	33	4	174	5	0	0	0	0	1,663	5
Front-end loader-forklift operator	572	2	10	1	27	1	7	1	13	4	629	2
Grader-scraper operator	189	1	0	0	7	0	0	0	0	0	195	1
Laborer-miner-utility man	3,570	12	107	13	528	15	56	8	23	7	4,284	12
Manager-foreman-supervisor:												
General	1,321	4	36	4	88	2	26	4	87	26	1,558	4
Maintenance	507	2	5	1	13	0	12	2	0	0	537	1
Working	1,575	5	41	5	213	6	20	3	25	7	1,874	5
Mechanic-welder-oiler- machinist	6,768	22	92	11	916	25	54	8	27	8	7,857	22
Mine technical support	3,641	12	55	7	271	7	70	10	39	12	4,076	11
Office worker	1,625	5	36	4	174	5	40	6	11	3	1,886	5
Plant operator-warehouseman	4,094	13	363	44	627	17	116	16	76	23	5,275	15
Shuttle car-tram operator	888	3	0	0	48	1	32	5	0	0	968	3
Truck driver	1,742	6	6	1	276	8	136	19	25	7	2,184	6
Total	30,423	100	829	100	3,642	100	711	100	335	100	35,940	100

¹As defined by MSHA; see appendix A for detailed explanation of job title grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-17.—Metallic mining 1986 workforce estimates: job title, by education

Job title grouping ¹	Some elementary		Some high school		High school diploma		Vocational diploma		Some college		College degree		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Backhoe-crane-dragline-shovel operator	39	7	61	11	281	50	95	17	52	9	0	0	29	5	557	2
Beltman-belt repairman	0	0	50	39	52	41	0	0	0	0	0	0	25	20	127	0
Blaster	0	0	39	21	89	47	36	19	26	13	0	0	0	0	189	1
Deckhand-barge and dredge operator	0	0	0	0	7	55	0	0	6	45	0	0	0	0	12	0
Dozer-heavy and mobile equipment operator	19	2	110	11	662	64	51	5	97	9	22	2	80	8	1,040	3
Driller-rock bolter	141	14	133	13	555	54	42	4	128	12	30	3	0	0	1,029	3
Electrician-lampman	47	3	109	7	492	30	513	31	348	21	66	4	89	5	1,663	5
Front-end loader-forklift operator	66	11	103	16	362	58	22	3	47	8	5	1	23	4	629	2
Grader-scraper operator	27	14	37	19	112	57	20	10	0	0	0	0	0	0	195	1
Laborer-miner-utility man	288	7	695	16	2,202	51	407	9	514	12	100	2	79	2	4,284	12
Manager-foreman-supervisor:																
General	44	3	51	3	464	30	61	4	392	25	499	32	47	3	1,558	4
Maintenance	13	3	61	11	169	32	54	10	141	26	62	12	36	7	537	1
Working	29	2	181	10	814	43	125	7	261	14	411	22	51	3	1,874	5
Mechanic-welder-oiler- machinist	302	4	921	12	3,671	47	1,116	14	1,365	17	189	2	293	4	7,857	22
Mine technical support	107	3	228	6	1,184	29	106	3	866	21	1,513	37	71	2	4,076	11
Office worker	0	0	0	0	414	22	148	8	639	34	589	31	95	5	1,886	5
Plant operator-warehouseman	270	5	418	8	2,942	56	365	7	817	15	151	3	312	6	5,275	15
Shuttle car-tram operator	166	17	92	9	506	52	97	10	75	8	19	2	13	1	968	3
Truck driver	124	6	362	17	1,169	54	134	6	288	13	12	1	95	4	2,184	6
Total	1,682	5	3,650	10	16,147	45	3,391	9	6,064	17	3,668	10	1,337	4	35,940	100

¹As defined by MSHA; see appendix A for detailed explanation of job title grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-18.—Metallic mining 1986 workforce estimates:¹ principal equipment operated, by years of experience at job

Equipment operated grouping ²	0< to ≤1	1< to ≤2	2< to ≤3	3< to ≤5	5< to ≤10	10< to ≤20	20<	Unspeci- fied	Total	Median, yr
Backhoe-crane-dragline-shovel	56	40	69	23	181	215	61	6	650	10
Belt	72	0	0	0	25	30	0	0	127	1
Dozer-heavy and mobile equipment	221	45	103	95	194	119	101	83	961	5
Drill (underground)-rock bolter	135	100	21	163	222	150	0	32	823	5
Drill (surface)	42	33	58	53	94	19	10	19	328	4
Explosives	41	61	6	25	20	23	0	0	175	2
Front-end loader-forklift	232	165	100	113	263	101	1	28	1,003	3
Grader-scraper	18	30	10	6	94	38	0	0	195	7
Handtools (powered and nonpowered)	923	625	451	678	1,948	2,500	638	125	7,888	9
Hoist-elevator	13	14	22	71	75	14	9	3	221	5
Many equipment	202	111	127	43	9	70	0	6	567	2
Miscellaneous utility equipment	844	348	165	144	353	425	65	26	2,371	2
Plant equipment	1,091	449	353	518	767	579	214	64	4,036	4
Pump	81	39	6	24	21	0	25	0	195	2
Scale-lab equipment-controls	411	307	146	107	466	214	105	16	1,772	4
Shuttle car-locomotive	278	164	78	114	313	62	41	0	1,050	4
Truck (haulage)	444	329	235	156	486	369	149	131	2,299	5
Truck (utility)-personnel carrier	100	57	123	168	336	274	14	10	1,080	6
Welding machine-lathe	141	77	27	16	487	528	337	19	1,632	11
None	1,204	629	590	744	1,781	674	343	247	6,212	5
Not elsewhere classified	49	10	61	65	43	48	4	15	294	4
Unspecified	16	32	15	25	47	40	0	0	174	5
Total	6,616	3,665	2,764	3,349	8,223	6,492	2,117	828	34,054	6

¹Excluding job title category of office workers.²See appendix B for detailed explanation of equipment operated grouping.

NOTE—Owing to independent rounding, data may not add to totals shown.

Table E-19.—Metallic mining 1986 workforce estimates:¹ principal equipment operated, by hours of training received in last 2 years

Equipment operated grouping ²	0	1-8	9-15	16	17-40	41-80	81-160	161+	Unspeci- fied	Total	Mean, h
Backhoe-crane-dragline-shovel	27	11	0	81	189	28	0	108	205	650	61
Belt	0	0	32	0	55	0	0	0	40	127	20
Dozer-heavy and mobile equipment	31	17	25	113	402	74	0	50	250	961	40
Drill (underground)-rock bolter	88	6	0	222	131	40	16	70	249	823	66
Drill (surface)	15	0	7	43	53	109	6	25	71	328	56
Explosives	25	0	0	8	39	44	0	0	59	175	30
Front-end loader-forklift	12	24	69	121	318	68	28	77	286	1,003	53
Grader-scraper	0	29	0	82	21	6	3	0	54	195	20
Handtools (powered and nonpowered)	415	166	99	1,183	3,085	470	126	648	1,696	7,888	50
Hoist-elevator	50	0	6	85	52	13	0	0	15	221	17
Many equipment	6	81	0	281	34	25	44	54	41	567	51
Miscellaneous utility equipment	80	93	182	309	866	184	34	74	549	2,371	34
Plant equipment	61	66	194	376	1,782	333	120	337	766	4,036	49
Pump	12	9	30	33	94	18	0	0	0	195	23
Scale-lab equipment-controls	125	91	120	174	685	115	30	25	407	1,772	26
Shuttle car-locomotive	8	19	0	284	246	207	33	14	239	1,050	36
Truck (haulage)	158	52	34	226	807	131	42	113	736	2,299	41
Truck (utility)-personnel carrier	83	166	0	259	184	90	28	200	69	1,080	55
Welding machine-lathe	145	47	70	322	587	93	33	92	242	1,632	35
None	325	349	223	773	1,740	542	366	146	1,748	6,212	37
Not elsewhere classified	0	0	32	70	92	45	15	0	41	294	29
Unspecified	0	0	9	0	75	56	0	0	34	174	32
Total	1,667	1,227	1,132	5,046	11,535	2,691	924	2,035	7,798	34,054	43

¹Excluding job title category of office workers.²See appendix B for detailed explanation of equipment operated grouping.

NOTE—Owing to independent rounding, data may not add to totals shown.

Table E-20.—Metallic mining 1986 workforce estimates:¹ principal equipment operated, by years of age

Equipment operated grouping ²	Years of age								Unspecified	Total	Mean, yr
	15-20	21-23	24-26	27-29	30-34	35-39	40-49	50+			
Backhoe-crane-dragline-shovel	0	6	9	49	112	114	166	190	4	650	43
Belt	0	0	0	20	0	45	62	0	0	127	39
Dozer-heavy and mobile equipment	0	11	45	80	141	234	266	175	10	961	41
Drill (underground)-rock bolter	23	0	35	33	171	216	237	109	0	823	38
Drill (surface)	3	0	6	42	52	100	74	51	0	328	39
Explosives	0	16	0	8	45	14	38	55	0	175	42
Front-end loader-forklift	7	33	84	92	174	122	273	208	11	1,003	39
Grader-scraper	0	3	9	20	56	19	72	18	0	195	39
Handtools (powered and nonpowered)	25	119	287	507	1,187	1,634	2,342	1,748	41	7,888	41
Hoist-elevator	0	0	8	21	15	15	89	73	0	221	45
Many equipment	13	20	13	49	87	118	110	156	0	567	41
Miscellaneous utility equipment	103	99	138	191	495	427	494	381	45	2,371	37
Plant equipment	62	166	237	262	858	657	962	814	18	4,036	39
Pump	0	0	18	30	27	33	60	28	0	195	39
Scale-lab equipment-controls	27	90	75	215	296	249	571	244	6	1,772	38
Shuttle car-locomotive	0	0	48	182	68	263	294	195	0	1,050	39
Truck (hauling)	38	65	150	161	295	369	677	458	87	2,299	40
Truck (utility)-personnel carrier	6	16	6	61	177	123	353	339	0	1,080	44
Welding machine-lathe	0	5	11	35	240	199	633	503	6	1,632	44
None	6	56	220	415	1,028	1,146	1,655	1,612	74	6,212	42
Not elsewhere classified	5	5	28	6	24	76	78	72	0	294	41
Unspecified	0	3	7	33	18	0	53	54	6	174	41
Total	317	711	1,433	2,511	5,564	6,171	9,559	7,482	308	34,054	41

¹Excluding job title category of office workers.²See appendix B for detailed explanation of equipment operated grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-21.—Metallic mining 1986 workforce estimates:¹ principal equipment operated, by sex

Equipment operated grouping ²	Male		Female		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Backhoe-crane-dragline-shovel	615	2	30	3	5	4	650	2
Belt	127	0	0	0	0	0	127	0
Dozer-heavy and mobile equipment	949	3	0	0	12	9	961	3
Drill (underground)-rock bolter	823	3	0	0	0	0	823	2
Drill (surface)	328	1	0	0	0	0	328	1
Explosives	150	0	26	2	0	0	175	1
Front-end loader-forklift	901	3	91	8	11	8	1,003	3
Grader-scraper	195	1	0	0	0	0	195	1
Handtools (powered and nonpowered)	7,843	24	20	2	25	19	7,888	23
Hoist-elevator	202	1	12	1	6	5	221	1
Many equipment	567	2	0	0	0	0	567	2
Miscellaneous utility equipment	2,215	7	150	13	6	5	2,371	7
Plant equipment	3,890	12	139	12	6	5	4,036	12
Pump	189	1	6	1	0	0	195	1
Scale-lab equipment-controls	1,459	4	313	26	0	0	1,772	5
Shuttle car-locomotive	1,050	3	0	0	0	0	1,050	3
Truck (hauling)	2,254	7	45	4	0	0	2,299	7
Truck (utility)-personnel carrier	1,044	3	37	3	0	0	1,080	3
Welding machine-lathe	1,632	5	0	0	0	0	1,632	5
None	5,842	18	306	26	64	47	6,212	18
Not elsewhere classified	288	1	6	0	0	0	294	1
Unspecified	171	1	3	0	0	0	174	1
Total	32,735	100	1,182	100	136	100	34,054	100

¹Excluding job title category of office workers.²See appendix B for detailed explanation of equipment operated grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-22.—Metallic mining 1986 workforce estimates:¹ principal equipment operated, by race

Equipment operated grouping ²	White		Black		Hispanic		Other		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Backhoe-crane-dragline-shovel	603	2	0	0	46	1	0	0	0	0	650	2
Belt	102	0	25	3	0	0	0	0	0	0	127	0
Dozer-heavy and mobile equipment	801	3	20	3	80	2	50	8	10	3	961	3
Drill (underground)-rock bolter	616	2	25	3	129	4	53	8	0	0	823	2
Drill (surface)	313	1	0	0	15	0	0	0	0	0	328	1
Explosives	106	0	0	0	25	1	45	7	0	0	175	1
Front-end loader-forklift	863	3	77	10	43	1	7	1	13	4	1,003	3
Grader-scraper	189	1	0	0	7	0	0	0	0	0	195	1
Handtools (powered and nonpowered)	6,676	23	125	16	1,016	29	44	7	27	8	7,888	23
Hoist-elevator	139	0	25	3	56	2	0	0	0	0	221	1
Many equipment	545	2	0	0	14	0	1	0	6	2	567	2
Miscellaneous utility equipment	1,919	7	76	10	352	10	7	1	17	5	2,371	7
Plant equipment	3,345	12	167	21	353	10	95	14	76	24	4,036	12
Pump	107	0	25	3	63	2	0	0	0	0	195	1
Scale-lab equipment-controls	1,502	5	3	0	201	6	33	5	33	10	1,772	5
Shuttle car-locomotive	920	3	25	3	73	2	32	5	0	0	1,050	3
Truck (haulage)	1,803	6	6	1	330	10	136	20	25	8	2,299	7
Truck (utility)-personnel carrier	842	3	20	2	153	4	66	10	0	0	1,080	3
Welding machine-lathe	1,527	5	0	0	90	3	15	2	0	0	1,632	5
None	5,516	19	150	19	367	11	62	9	118	36	6,212	18
Not elsewhere classified	261	1	25	3	6	0	3	0	0	0	294	1
Unspecified	103	0	0	0	50	1	22	3	0	0	174	1
Total	28,798	100	793	100	3,469	100	671	100	324	100	34,054	100

¹Excluding job title category of office workers.²See appendix B for detailed explanation of equipment operated grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-23.—Metallic mining 1986 workforce estimates:¹ principal equipment operated, by education

Equipment operated grouping ²	Some elementary		Some high school		High school diploma		Vocational diploma		Some college		College degree		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Backhoe-crane-dragline-shovel	39	6	75	12	374	58	72	11	61	9	0	0	29	4	650	2
Belt	0	0	50	39	52	41	0	0	0	0	0	0	25	20	127	0
Dozer-heavy and mobile equipment	6	1	115	12	596	62	51	5	108	11	6	1	80	8	961	3
Drill (underground)-rock bolter	133	16	91	11	457	56	34	4	78	9	30	4	0	0	823	2
Drill (surface)	7	2	49	15	222	68	0	0	51	15	0	0	0	0	328	1
Explosives	0	0	39	22	75	43	36	20	26	15	0	0	0	0	175	1
Front-end loader-forklift	66	7	124	12	635	63	28	3	99	10	21	2	30	3	1,003	3
Grader-scraper	27	14	37	19	112	57	20	10	0	0	0	0	0	0	195	1
Handtools (powered and nonpowered)	262	3	848	11	3,296	42	1,411	18	1,512	19	177	2	382	5	7,888	23
Hoist-elevator	37	17	41	19	80	36	33	15	15	7	8	3	6	3	221	1
Many equipment	8	1	33	6	354	62	38	7	64	11	45	8	25	4	567	2
Miscellaneous utility equipment	179	8	427	18	1,174	50	194	8	288	12	56	2	54	2	2,371	7
Plant equipment	284	7	319	8	2,159	53	304	8	600	15	137	3	234	6	4,036	12
Pump	0	0	42	21	82	42	21	11	30	15	12	6	9	5	195	1
Scale-lab equipment-controls	8	0	112	6	760	43	62	3	452	26	341	19	37	2	1,772	5
Shuttle car-locomotive	127	12	86	8	609	58	97	9	100	10	19	2	13	1	1,050	3
Truck (haulage)	137	6	370	16	1,247	54	134	6	296	13	18	1	97	4	2,299	7
Truck (utility)-personnel carrier	53	5	86	8	597	55	96	9	139	13	108	10	0	0	1,080	3
Welding machine-lathe	72	4	168	10	858	53	191	12	251	15	93	6	0	0	1,632	5
None	216	3	436	7	1,769	28	382	6	1,214	20	1,998	32	198	3	6,212	18
Not elsewhere classified	23	8	53	18	110	38	39	13	39	13	6	2	25	8	294	1
Unspecified	0	0	50	29	116	66	0	0	3	2	6	3	0	0	174	1
Total	1,682	5	3,650	11	15,733	46	3,243	10	5,425	16	3,079	9	1,242	4	34,054	100

¹Excluding job title category of office workers.²See appendix B for detailed explanation of equipment operated grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-24.—Metallic mining 1986 workforce estimates: job, company, and mining experience, by work location

Experience, yr	Underground mine		Surface at underground mine		Surface mine		Plant or mill		Office		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
At present job:												
0< to ≤1	1,115	22	265	15	2,155	20	2,831	19	606	20	6,972	19
1< to ≤2	618	12	249	14	1,157	11	1,408	9	460	15	3,892	11
2< to ≤3	603	12	142	8	1,054	10	908	6	241	8	2,948	8
3< to ≤5	812	16	269	15	814	7	1,267	8	440	14	3,602	10
5< to ≤10	1,144	23	415	24	2,747	25	3,560	24	816	26	8,682	24
10< to ≤20	612	12	357	20	1,900	17	3,563	24	345	11	6,777	19
20<	12	0	22	1	696	6	1,335	9	112	4	2,177	6
Unspecified	64	1	38	2	468	4	253	2	67	2	891	2
Total	4,980	100	1,756	100	10,992	100	15,126	100	3,087	100	35,940	100
Median yr.	4	NAP	5	NAP	6	NAP	7	NAP	5	NAP	6	NAP
At present company:												
0< to ≤1	1,024	21	426	24	1,364	12	1,365	9	422	14	4,601	13
1< to ≤5	1,020	20	367	21	2,242	20	2,051	14	571	18	6,251	17
5< to ≤10	1,595	32	323	18	2,004	18	3,293	22	1,049	34	8,264	23
10< to ≤15	630	13	206	12	1,944	18	2,639	17	512	17	5,931	17
15< to ≤20	384	8	221	13	1,586	14	2,767	18	285	9	5,244	15
20< to ≤25	202	4	49	3	672	6	1,234	8	98	3	2,255	6
25< to ≤30	51	1	93	5	433	4	885	6	51	2	1,513	4
30<	46	1	28	2	665	6	785	5	86	3	1,610	4
Unspecified	27	1	44	3	82	1	106	1	12	0	272	1
Total	4,980	100	1,756	100	10,992	100	15,126	100	3,087	100	35,940	100
Median yr.	7	NAP	7	NAP	10	NAP	12	NAP	8	NAP	10	NAP
Total mining:												
0< to ≤1	192	4	50	3	625	6	594	4	197	6	1,658	5
1< to ≤5	510	10	229	13	1,548	14	1,375	9	382	12	4,045	11
5< to ≤10	1,506	30	283	16	1,690	15	3,295	22	902	29	7,676	21
10< to ≤15	1,119	22	267	15	2,015	18	2,909	19	378	12	6,687	19
15< to ≤20	788	16	352	20	1,544	14	2,926	19	367	12	5,978	17
20< to ≤25	483	10	149	8	682	6	1,380	9	193	6	2,887	8
25< to ≤30	136	3	205	12	415	4	962	6	68	2	1,785	5
30<	134	3	164	9	665	6	900	6	97	3	1,960	5
Unspecified	112	2	58	3	1,808	16	784	5	503	16	3,264	9
Total	4,980	100	1,756	100	10,992	100	15,126	100	3,087	100	35,940	100
Median yr.	11	NAP	16	NAP	12	NAP	13	NAP	10	NAP	12	NAP

NAP Not applicable.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-25.—Metallic mining 1986 workforce estimates: training received, by work location

Job training for last 2 yr, h	Underground mine		Surface at underground mine		Surface mine		Plant or mill		Office		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
0	175	4	156	9	819	7	393	3	463	15	2,007	6
1-8	250	5	63	4	429	4	357	2	243	8	1,342	4
9-15	7	0	191	11	133	1	787	5	77	2	1,195	3
16	1,755	35	437	25	1,206	11	1,471	10	357	12	5,226	15
17-40	767	15	132	8	3,460	31	6,928	46	504	16	11,792	33
41-80	582	12	287	16	700	6	1,013	7	206	7	2,788	8
81-160	171	3	100	6	415	4	208	1	90	3	984	3
161+	289	6	70	4	885	8	790	5	35	1	2,070	6
Unspecified	983	20	318	18	2,945	27	3,177	21	1,112	36	8,537	24
Total	4,980	100	1,756	100	10,992	100	15,126	100	3,087	100	35,940	100
Mean training . . . h . .	46	NAP	51	NAP	50	NAP	38	NAP	28	NAP	43	NAP

NAP Not applicable.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-26.—Metallic mining 1986 workforce estimates: age distribution, by work location

Age, yr	Underground mine		Surface at underground mine		Surface mine		Plant or mill		Office		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
15-20	52	1	13	1	122	1	130	1	14	0	330	1
21-23	51	1	29	2	291	3	320	2	59	2	749	2
24-26	264	5	51	3	557	5	516	3	81	3	1,468	4
27-29	661	13	108	6	773	7	855	6	210	7	2,608	7
30-34	960	19	153	9	1,992	18	2,226	15	479	16	5,811	16
35-39	1,027	21	232	13	1,932	18	2,740	18	701	23	6,632	18
40-49	1,183	24	597	34	2,823	26	4,614	31	947	31	10,165	28
50+	759	15	574	33	2,323	21	3,647	24	548	18	7,851	22
Unspecified	22	0	0	0	179	2	77	1	47	2	325	1
Total	4,980	100	1,756	100	10,992	100	15,126	100	3,087	100	35,940	100
Mean age.....yr..	38	NAP	44	NAP	40	NAP	42	NAP	41	NAP	41	NAP

NAP Not applicable.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-27.—Metallic mining 1986 workforce estimates: sex, race, and education, by work location

	Underground mine		Surface at underground mine		Surface mine		Plant or mill		Office		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Sex:												
Male	4,917	99	1,656	94	10,604	96	14,566	96	1,798	58	33,542	93
Female	38	1	55	3	371	3	509	3	1,282	42	2,255	6
Unspecified	24	0	44	3	17	0	51	0	6	0	143	0
Total	4,980	100	1,756	100	10,992	100	15,126	100	3,087	100	35,940	100
Race:												
White	4,474	90	1,595	91	9,337	85	12,370	82	2,647	86	30,423	85
Black	5	0	8	0	43	0	735	5	38	1	829	2
Hispanic	330	7	119	7	1,218	11	1,650	11	324	10	3,642	10
Other	146	3	34	2	299	3	188	1	43	1	711	2
Unspecified	24	0	0	0	95	1	183	1	34	1	335	1
Total	4,980	100	1,756	100	10,992	100	15,126	100	3,087	100	35,940	100
Education level:												
Some elementary	596	12	138	8	432	4	510	3	6	0	1,682	5
Some high school....	633	13	194	11	1,372	12	1,398	9	54	2	3,650	10
High school diploma..	2,375	48	826	47	5,466	50	6,846	45	634	21	16,147	45
Vocational diploma...	434	9	195	11	1,055	10	1,495	10	213	7	3,391	9
Some college	479	10	245	14	1,677	15	2,632	17	1,031	33	6,064	17
College degree	411	8	132	8	830	8	1,246	8	1,049	34	3,668	10
Unspecified	52	1	26	1	162	1	997	7	100	3	1,337	4
Total	4,980	100	1,756	100	10,992	100	15,126	100	3,087	100	35,940	100

NOTE —Owing to independent rounding, data may not equal to totals shown.

Table E-28.—Metallic mining 1986 workforce estimates:¹ experience at job, by hours of training received in last 2 years

Experience at present job, yr	0	1-8	9-15	16	17-40	41-80	81-160	161+	Unspecified	Total	Mean, h
0< to ≤1:											
Workers	212	496	291	553	2,516	577	350	484	1,137	6,616	49
pct	3	7	4	8	38	9	5	7	17	100	NAP
1< to ≤2:											
Workers	282	28	66	686	997	498	55	421	634	3,665	62
pct	8	1	2	19	27	14	2	11	17	100	NAP
2< to ≤3:											
Workers	159	44	74	530	387	327	144	471	629	2,764	72
pct	6	2	3	19	14	12	5	17	23	100	NAP
3< to ≤5:											
Workers	236	100	78	523	1,187	331	44	162	690	3,349	42
pct	7	3	2	16	35	10	1	5	21	100	NAP
5< to ≤10:											
Workers	430	346	232	1,114	2,550	688	216	302	2,345	8,223	36
pct	5	4	3	14	31	8	3	4	29	100	NAP
10< to ≤20:											
Workers	316	129	239	1,100	2,644	229	116	171	1,548	6,492	29
pct	5	2	4	17	41	4	2	3	24	100	NAP
20<:											
Workers	10	60	122	408	1,171	36	0	25	285	2,117	25
pct	0	3	6	19	55	2	0	1	13	100	NAP
Unspecified:											
Workers	23	25	30	131	85	5	0	0	530	828	15
pct	3	3	4	16	10	1	0	0	64	100	NAP
Total:											
Workers	1,667	1,227	1,132	5,045	11,535	2,691	924	2,035	7,798	34,054	43
pct	5	4	3	15	34	8	3	6	23	100	NAP

NAP Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-29.—Metallic mining 1986 workforce estimates:¹ experience at job, by years of age

Experience at present job, yr	15-20	21-23	24-26	27-29	30-34	35-39	40-49	50+	Unspecified	Total	Mean, yr
0< to ≤1:											
Workers	237	477	664	790	1,314	1,023	1,256	777	78	6,616	35
pct	4	7	10	12	20	15	19	12	1	100	NAP
1< to ≤2:											
Workers	56	109	278	280	1,061	521	827	448	85	3,665	37
pct	2	3	8	8	29	14	23	12	2	100	NAP
2< to ≤3:											
Workers	12	44	182	348	466	637	589	448	35	2,764	38
pct	0	2	7	13	17	23	21	16	1	100	NAP
3< to ≤5:											
Workers	6	41	159	220	802	736	809	490	86	3,349	39
pct	0	1	5	7	24	22	24	15	3	100	NAP
5< to ≤10:											
Workers	0	14	98	743	1,269	1,903	2,636	1,543	18	8,223	41
pct	0	0	1	9	15	23	32	19	0	100	NAP
10< to ≤20:											
Workers	0	0	0	58	503	1,211	2,754	1,967	0	6,492	45
pct	0	0	0	1	8	19	42	30	0	100	NAP
20<:											
Workers	0	0	0	0	0	0	511	1,600	6	2,117	54
pct	0	0	0	0	0	0	24	76	0	100	NAP
Unspecified:											
Workers	5	26	52	72	149	138	177	209	0	828	40
pct	1	3	6	9	18	17	21	25	0	100	NAP
Total:											
Workers	317	711	1,433	2,511	5,564	6,171	9,559	7,482	308	34,054	41
pct	1	2	4	7	16	18	28	22	1	100	NAP

NAP Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-30.—Metallic mining 1986 workforce estimates:¹ experience at job, by sex

Experience at present job, yr	Male		Female		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct
0< to ≤1	6,184	19	370	31	61	45	6,616	19
1< to ≤2	3,522	11	138	12	5	4	3,665	11
2< to ≤3	2,658	8	100	8	6	5	2,764	8
3< to ≤5	3,254	10	95	8	0	0	3,349	10
5< to ≤10	7,829	24	375	32	19	14	8,223	24
10< to ≤20	6,440	20	20	2	32	23	6,492	19
20<	2,074	6	30	3	13	9	2,117	6
Unspecified	774	2	54	5	0	0	828	2
Total	32,735	100	1,182	100	136	100	34,054	100
Medianyr.	6	NAp	3	NAp	3	NAp	6	NAp

NAp Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-31.—Metallic mining 1986 workforce estimates:¹ experience at job, by race

Experience at present job, yr	White		Black		Hispanic		Other		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
0< to ≤1	5,517	19	158	20	540	16	170	25	232	71	6,616	19
1< to ≤2	2,957	10	68	9	462	13	145	22	34	10	3,665	11
2< to ≤3	2,384	8	31	4	277	8	47	7	26	8	2,764	8
3< to ≤5	2,742	10	48	6	469	14	91	14	0	0	3,349	10
5< to ≤10	6,803	24	211	27	1,027	30	176	26	6	2	8,223	24
10< to ≤20	5,697	20	182	23	583	17	28	4	2	0	6,492	19
20<	1,898	7	95	12	98	3	2	0	25	8	2,117	6
Unspecified	801	3	0	0	14	0	14	2	0	0	828	2
Total	28,798	100	793	100	3,469	100	671	100	324	100	34,054	100
Medianyr.	6	NAp	7	NAp	5	NAp	3	NAp	1	NAp	6	NAp

NAp Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-32.—Metallic mining 1986 workforce estimates:¹ experience at job, by education

Experience at present job, yr	Some elementary		Some high school		High school diploma		Vocational diploma		Some college		College degree		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
0< to ≤1	163	10	678	19	3,101	20	758	23	895	17	793	26	228	18	6,616	19
1< to ≤2	105	6	416	11	1,732	11	275	8	578	11	444	14	116	9	3,665	11
2< to ≤3	56	3	212	6	1,278	8	144	4	661	12	367	12	46	4	2,764	8
3< to ≤5	214	13	349	10	1,285	8	315	10	637	12	436	14	113	9	3,349	10
5< to ≤10	441	26	936	26	3,525	22	827	26	1,551	29	719	23	223	18	8,223	24
10< to ≤20	443	26	721	20	3,302	21	769	24	825	15	140	5	292	23	6,492	19
20<	255	15	276	8	958	6	128	4	170	3	106	3	225	18	2,117	6
Unspecified	5	0	63	2	552	4	27	1	108	2	74	2	0	0	828	2
Total	1,682	100	3,650	100	15,733	100	3,243	100	5,425	100	3,079	100	1,242	100	34,054	100
Medianyr.	8	NAp	6	NAp	6	NAp	6	NAp	5	NAp	3	NAp	8	NAp	6	NAp

NAp Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-33.—Metallic mining 1986 workforce estimates:¹ experience at company, by hours of training received in last 2 years

Experience at present company, yr	0	1-8	9-15	16	17-40	41-80	81-160	161+	Unspecified	Total	Mean, h
0< to ≤1:											
Workers	199	594	495	705	1,087	326	86	69	749	4,312	27
pct	5	14	11	16	25	8	2	2	17	100	NAP
1< to ≤5:											
Workers	219	102	101	839	1,091	798	347	737	1,682	5,915	74
pct	4	2	2	14	18	13	6	12	28	100	NAP
5< to ≤10:											
Workers	443	314	192	1,262	2,137	1,051	179	511	1,624	7,713	48
pct	6	4	2	16	28	14	2	7	21	100	NAP
10< to ≤15:											
Workers	387	63	120	529	2,195	301	166	332	1,475	5,568	43
pct	7	1	2	9	39	5	3	6	26	100	NAP
15< to ≤20:											
Workers	330	51	60	632	2,364	106	44	154	1,323	5,064	29
pct	7	1	1	12	47	2	1	3	26	100	NAP
20< to ≤25:											
Workers	33	60	103	341	1,020	15	44	87	486	2,188	31
pct	2	3	5	16	47	1	2	4	22	100	NAP
25< to ≤30:											
Workers	46	0	0	393	702	44	28	52	217	1,482	32
pct	3	0	0	27	47	3	2	4	15	100	NAP
30<:											
Workers	10	0	25	298	819	39	30	93	238	1,552	36
pct	1	0	2	19	53	3	2	6	15	100	NAP
Unspecified:											
Workers	0	42	36	46	120	11	0	0	6	260	18
pct	0	16	14	18	46	4	0	0	2	100	NAP
Total:											
Workers	1,667	1,227	1,132	5,046	11,535	2,691	924	2,035	7,798	34,054	43
pct	5	4	3	15	34	8	3	6	23	100	NAP

NAP Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-34.—Metallic mining 1986 workforce estimates:¹ experience at company, by years of age

Experience at present company, yr	15-20	21-23	24-26	27-29	30-34	35-39	40-49	50+	Unspecified	Total	Mean, yr
0< to ≤1:											
Workers	181	368	538	273	497	518	1,034	831	71	4,312	37
pct	4	9	12	6	12	12	24	19	2	100	NAP
1< to ≤5:											
Workers	119	318	553	707	1,239	983	1,114	676	207	5,915	36
pct	2	5	9	12	21	17	19	11	3	100	NAP
5< to ≤10:											
Workers	0	9	342	1,332	2,023	1,543	1,727	713	24	7,713	37
pct	0	0	4	17	26	20	22	9	0	100	NAP
10< to ≤15:											
Workers	0	0	0	199	1,634	1,729	1,270	730	5	5,568	39
pct	0	0	0	4	29	31	23	13	0	100	NAP
15< to ≤20:											
Workers	0	0	0	0	166	1,239	2,653	1,006	0	5,064	44
pct	0	0	0	0	3	24	52	20	0	100	NAP
20< to ≤25:											
Workers	0	0	0	0	0	123	1,299	766	0	2,188	48
pct	0	0	0	0	0	6	59	35	0	100	NAP
25< to ≤30:											
Workers	0	0	0	0	0	0	381	1,102	0	1,482	54
pct	0	0	0	0	0	0	26	74	0	100	NAP
30<:											
Workers	0	0	0	0	0	0	34	1,518	0	1,552	57
pct	0	0	0	0	0	0	2	98	0	100	NAP
Unspecified:											
Workers	17	16	0	0	5	35	46	142	0	260	47
pct	6	6	0	0	2	14	18	55	0	100	NAP
Total:											
Workers	317	711	1,433	2,511	5,564	6,171	9,559	7,482	308	34,054	41
pct	1	2	4	7	16	18	28	22	1	100	NAP

NAP Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-35.—Metallic mining 1986 workforce estimates:¹ experience at company, by sex

Experience at present company, yr	Male		Female		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct
0< to ≤1	4,027	12	248	21	36	26	4,312	13
1< to ≤5	5,552	17	338	29	25	18	5,915	17
5< to ≤10	7,333	22	380	32	0	0	7,713	23
10< to ≤15	5,402	17	161	14	5	4	5,568	16
15< to ≤20	5,039	15	25	2	0	0	5,064	15
20< to ≤25	2,158	7	30	3	0	0	2,188	6
25< to ≤30	1,482	5	0	0	0	0	1,482	4
30<	1,552	5	0	0	0	0	1,552	5
Unspecified	190	1	0	0	70	51	260	1
Total	32,735	100	1,182	100	136	100	34,054	100
Median yr.	10	NAp	6	NAp	1	NAp	10	NAp

NAp Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-36.—Metallic mining 1986 workforce estimates:¹ experience at company, by race

Experience at present company, yr	White		Black		Hispanic		Other		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
0< to ≤1	3,757	13	16	2	248	7	120	18	171	53	4,312	13
1< to ≤5	4,954	17	177	22	491	14	208	31	85	26	5,915	17
5< to ≤10	6,515	23	113	14	915	26	128	19	42	13	7,713	23
10< to ≤15	4,762	17	134	17	578	17	92	14	2	0	5,568	16
15< to ≤20	3,972	14	198	25	829	24	65	10	0	0	5,064	15
20 to ≤25	1,846	6	80	10	213	6	49	7	0	0	2,188	6
25 to ≤30	1,409	5	14	2	26	1	9	1	25	8	1,482	4
30	1,329	5	56	7	167	5	0	0	0	0	1,552	5
Unspecified	254	1	6	1	0	0	0	0	0	0	260	1
Total	28,798	100	793	100	3,469	100	671	100	324	100	34,054	100
Median yr.	10	NAp	13	NAp	12	NAp	6	NAp	1	NAp	10	NAp

NAp Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-37.—Metallic mining 1986 workforce estimates:¹ experience at company, by education

Experience at present company, yr	Some elementary		Some high school		High school diploma		Vocational diploma		Some college		College degree		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
0< to ≤1	134	8	266	7	2,238	14	538	17	675	12	342	11	118	10	4,312	13
1< to ≤5	53	3	477	13	2,583	16	533	16	1,197	22	840	27	233	19	5,915	17
5< to ≤10	308	18	632	17	3,188	20	825	25	1,595	29	1,003	33	162	13	7,713	23
10< to ≤15	172	10	693	19	2,583	16	557	17	882	16	448	15	232	19	5,568	16
15< to ≤20	317	19	769	21	2,644	17	486	15	457	8	157	5	235	19	5,064	15
20< to ≤25	73	4	337	9	1,180	7	60	2	308	6	106	3	125	10	2,188	6
25< to ≤30	245	15	190	5	613	4	118	4	112	2	79	3	125	10	1,482	4
30<	374	22	277	8	611	4	123	4	127	2	40	1	0	0	1,552	5
Unspecified	6	0	10	0	93	1	3	0	72	1	64	2	12	1	260	1
Total	1,682	100	3,650	100	15,733	100	3,243	100	5,425	100	3,079	100	1,242	100	34,054	100
Median . . . yr.	18	NAp	13	NAp	10	NAp	9	NAp	8	NAp	7	NAp	13	NAp	10	NAp

NAp Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-38.—Metallic mining 1986 workforce estimates:¹ age, by education

Age, yr	Some elementary		Some high school		High school diploma		Vocational diploma		Some college		College degree		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
15-20	0	0	6	2	193	61	20	6	78	24	15	5	6	2	317	100
21-23	0	0	49	7	396	56	79	11	121	17	55	8	11	2	711	100
24-26	14	1	115	8	742	52	126	9	259	18	166	12	11	1	1,433	100
27-29	20	1	184	7	1,297	52	196	8	492	20	291	12	31	1	2,511	100
30-34	72	1	281	5	2,656	48	549	10	1,094	20	773	14	138	2	5,564	100
35-39	163	3	471	8	2,670	43	759	12	1,186	19	700	11	221	4	6,171	100
40-49	458	5	1,369	14	4,513	47	926	10	1,266	13	674	7	352	4	9,559	100
50+	955	13	1,152	15	3,204	43	589	8	864	12	365	5	354	5	7,482	100
Unspecified	0	0	23	7	62	20	0	0	64	21	40	13	118	38	308	100
Total	1,682	5	3,650	11	15,733	46	3,243	10	5,425	16	3,079	9	1,242	4	34,054	100
Mean age...yr..	50	NAP	44	NAP	40	NAP	40	NAP	39	NAP	38	NAP	44	NAP	41	NAP

NAP Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-39.—Metallic mining 1986 workforce estimates:¹ age, race, and education, by sex

	Male		Female		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Age, yr:								
15-20	303	1	13	1	0	0	317	1
21-23	673	2	32	3	5	4	711	2
24-26	1,255	4	178	15	0	0	1,433	4
27-29	2,313	7	168	14	30	22	2,511	7
30-34	5,407	17	157	13	0	0	5,564	16
35-39	6,008	18	144	12	19	14	6,171	18
40-49	9,215	28	331	28	13	9	9,559	28
50+	7,285	22	152	13	44	33	7,482	22
Unspecified	276	1	6	0	26	19	308	1
Total	32,735	100	1,182	100	136	100	34,054	100
Mean age...yr..	41	NAP	37	NAP	43	NAP	41	NAP
Race:								
White	27,715	85	997	84	85	63	28,798	85
Black	793	2	0	0	0	0	793	2
Hispanic	3,324	10	145	12	0	0	3,469	10
Other	642	2	29	2	0	0	671	2
Unspecified	262	1	11	1	51	37	324	1
Total	32,735	100	1,182	100	136	100	34,054	100
Education level:								
Some elementary	1,644	5	31	3	6	5	1,682	5
Some high school	3,531	11	120	10	0	0	3,650	11
High school diploma ..	15,212	46	467	39	55	40	15,733	46
Vocational diploma ..	3,107	9	136	12	0	0	3,243	10
Some college	5,213	16	206	17	5	4	5,425	16
College degree	2,817	9	217	18	44	32	3,079	9
Unspecified	1,211	4	5	0	26	19	1,242	4
Total	32,735	100	1,182	100	136	100	34,054	100

NAP Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-40.—Metallic mining 1986 workforce estimates:¹ age and education, by race

	White		Black		Hispanic		Other		Unspecified		Total	
	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct	Workers	pct
Age, yr:												
15-20	248	1	0	0	51	1	12	2	6	2	317	1
21-23	562	2	14	2	74	2	19	3	41	13	711	2
24-26	1,184	4	12	1	160	5	52	8	25	8	1,433	4
27-29	2,142	7	21	3	265	8	58	9	25	8	2,511	7
30-34	4,816	17	74	9	490	14	110	16	74	23	5,564	16
35-39	5,255	18	173	22	612	18	100	15	32	10	6,171	18
40-49	7,838	27	286	36	1,217	35	161	24	56	17	9,559	28
50+	6,519	23	204	26	578	17	157	23	25	8	7,482	22
Unspecified	234	1	10	1	21	1	2	0	40	12	308	1
Total	28,798	100	793	100	3,469	100	671	100	324	100	34,054	100
Mean age.....yr..	41	NAP	43	NAP	40	NAP	39	NAP	34	NAP	41	NAP
Education level:												
Some elementary	1,424	5	10	1	187	5	62	9	0	0	1,682	5
Some high school	3,034	11	51	6	437	13	108	16	21	6	3,650	11
High school diploma ..	13,162	46	385	49	1,792	52	315	47	79	24	15,733	46
Vocational diploma ..	2,815	10	32	4	313	9	44	7	39	12	3,243	10
Some college	4,619	16	64	8	584	17	107	16	50	15	5,425	16
College degree	2,851	10	0	0	112	3	31	5	84	26	3,079	9
Unspecified	892	3	250	32	45	1	4	1	52	16	1,242	4
Total	28,798	100	793	100	3,469	100	671	100	324	100	34,054	100

NAP Not applicable.

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-41.—Metallic mining 1986 workforce estimates: number of workers and coefficient of variation, by employment size class

Employment size class ¹	Workers	CV, pct
1-19	1,771	16.0
20-49	1,695	27.3
50-99	2,101	15.5
100-249	7,715	6.6
250-499	5,590	1.0
500+	17,068	.5
All groupings	35,940	1.4

¹MSHA size groups are based on the annual average employment of the primary subunit and not on the total employment; hence, MSHA published injury statistics by size groups should not be analyzed against these data.

NOTE —Owing to independent rounding, data may not add to totals shown.

Table E-42.—Metallic mining 1986 workforce estimates: number of workers and coefficient of variation, by job title

Job title grouping ¹	Workers	CV, pct
Backhoe-crane-dragline-shovel operator	557	28.6
Beltman-belt repairman	127	69.1
Blaster	189	26.2
Deckhand-barge and dredge operator	12	65.8
Dozer-heavy and mobile equipment operator	1,040	10.2
Driller-rock bolter	1,029	12.2
Electrician-lampman	1,663	7.8
Front-end loader-forklift operator	629	13.2
Grader-scraper operator	195	28.9
Laborer-miner-utility man	4,284	7.0
Manager-foreman-supervisor:		
General	1,558	6.8
Maintenance	537	19.1
Working	1,874	9.9
Mechanic-welder-oiler-machinist	7,857	3.6
Mine technical support	4,076	7.3
Office worker	1,886	9.7
Plant operator-warehouseman	5,275	2.4
Shuttle car-tram operator	968	14.5
Truck driver	2,184	8.4
All groupings	35,940	1.4

¹As defined by MSHA; see appendix A for detailed explanation of job title grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

**Table E-43.—Metallic mining 1986 workforce estimates:¹
number of workers and coefficient of variation, by principal
equipment operated**

Equipment operated grouping ²	Workers	CV, pct
Backhoe-crane-dragline-shovel	650	22.9
Belt	127	69.1
Dozer-heavy and mobile equipment	961	11.0
Drill (underground)-rock bolter	823	19.0
Drill (surface)	328	16.1
Explosives	175	29.3
Front-end loader-forklift	1,003	8.7
Grader-scraper	195	28.9
Handtools (powered and nonpowered)	7,888	2.3
Hoist-elevator	221	16.2
Many equipment	567	33.5
Miscellaneous utility equipment	2,371	11.0
Plant equipment	4,036	5.9
Pump	195	38.4
Scale-lab equipment-controls	1,772	13.1
Shuttle car-locomotive	1,050	9.8
Truck (haulage)	2,299	7.5
Truck (utility)-personnel carrier	1,080	12.6
Welding machine-lathe	1,632	10.3
None	6,212	4.9
Not elsewhere classified	294	34.0
Unspecified	174	36.8
All groupings	34,054	1.6

¹Excluding job title category of office workers.

²See appendix B for detailed explanation of equipment operated grouping.

NOTE —Owing to independent rounding, data may not add to totals shown.

**Table E-44.—Metallic mining 1986 workforce estimates:
number of workers and coefficient of variation,
by work location**

Work location	Workers	CV, pct
Underground mine	4,980	8.9
Surface at underground mine	1,756	6.5
Surface mine	10,992	2.8
Plant or mill	15,126	3.8
Office	3,087	6.3
All groupings	35,940	1.4

NOTE —Owing to independent rounding, data may not add to totals shown.

**Table E-45.—Metallic mining 1986 workforce estimates:¹
number of workers and coefficient of variation, by
experience at job, company, and mining**

Experience, yr	Workers	CV, pct
At present job:		
0< to ≤1	6,616	7.2
1< to ≤2	3,665	7.2
2< to ≤3	2,764	3.4
3< to ≤5	3,349	4.9
5< to ≤10	8,223	5.2
10< to ≤20	6,492	3.2
20<	2,117	10.0
Unspecified	828	15.7
All groupings	34,054	1.6
At present company:		
0< to ≤1	4,312	7.4
1< to ≤5	5,915	5.7
5< to ≤10	7,713	4.2
10< to ≤15	5,568	4.1
15< to ≤20	5,064	7.3
20< to ≤25	2,188	5.7
25< to ≤30	1,482	6.8
30<	1,552	6.0
Unspecified	260	40.5
All groupings	34,054	1.6
Total mining:		
0< to ≤1	1,524	11.3
1< to ≤5	3,830	5.0
5< to ≤10	7,141	3.3
10< to ≤15	6,413	3.4
15< to ≤20	5,751	6.0
20< to ≤25	2,740	7.4
25< to ≤30	1,740	9.7
30<	1,883	6.7
Unspecified	3,032	4.6
All groupings	34,054	1.6

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

**Table E-46.—Metallic mining 1986 workforce estimates:¹
number of workers and coefficient of variation,
by training received**

Job training for last 2 yr, h	Workers	CV, pct
0	1,667	7.9
1-8	1,227	16.3
9-15	1,132	7.1
16	5,046	6.3
17-40	11,535	4.2
41-80	2,691	9.9
81-160	924	12.4
161+	2,035	5.8
Unspecified	7,798	3.0
All groupings	34,054	1.6

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

**Table E-47.—Metallic mining 1986 workforce estimates:¹
number of workers and coefficient of variation, by age**

Age, yr	Workers	CV, pct
15-20	317	15.1
21-23	711	10.3
24-26	1,433	6.8
27-29	2,511	7.5
30-34	5,564	4.9
35-39	6,171	2.9
40-49	9,559	2.1
50+	7,482	3.4
Unspecified	308	7.6
All groupings	34,054	1.6

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

**Table E-48.—Metallic mining 1986 workforce estimates:¹
number of workers and coefficient of variation,
by sex, race, and education**

	Workers	CV, pct
Sex:		
Male	32,735	1.7
Female	1,182	10.6
Unspecified	136	51.9
All groupings	34,054	1.6
Race:		
White	28,798	2.3
Black	793	20.3
Hispanic	3,469	7.1
Other	671	8.6
Unspecified	324	31.8
All groupings	34,054	1.6
Education level:		
Some elementary	1,682	14.8
Some high school	3,650	7.2
High school diploma	15,733	1.7
Vocational diploma	3,243	7.3
Some college	5,425	1.6
College degree	3,079	8.1
Unspecified	1,242	12.8
All groupings	34,054	1.6

¹Excluding job title category of office workers.

NOTE —Owing to independent rounding, data may not add to totals shown.

**APPENDIX F.—MINING INDUSTRY POPULATION SURVEY LETTERS
AND QUESTIONNAIRE**



United States Department of the Interior

BUREAU OF MINES
2401 E STREET, NW.
WASHINGTON, D.C. 20241

Dear Mine Manager:

The Bureau of Mines, U.S. Department of the Interior, is requesting your help in conducting a survey of the mining industry. The survey is designed to characterize the nation's mine-worker population by occupation, job experience, training, age, and other factors. These data are necessary to accurately analyze the nation's mine accidents. At this time, the information sought by this survey cannot be obtained from any other source.

Your firm was randomly selected to represent firms of a similar size in your industry. Although your response to this survey is voluntary, the validity of the results depends upon a very high response rate. We urge you, therefore, to respond as completely and accurately as possible based upon information from your personnel files, management records, or direct response from individual workers at your mine.

Under no circumstances will the information you provide be identified by individual mine, company, or worker. The data will be used for statistical purposes only and the results of the survey when analyzed with accident statistics will be made available to the public in the form of official publications.

Instructions for completing the survey questionnaire are on the enclosed survey form. Questions regarding the survey should be directed to:

Ms. Shail Butani
Bureau of Mines
5629 Minnehaha Avenue South
Minneapolis, MN 55417
Telephone: (612) 725-4500

(Note: Collect calls regarding this survey will be accepted during regular business hours, 8:00 a.m. to 4:00 p.m., Central Time.)

Thank you for your time and effort.

Sincerely,

Robert C. Horton
Director

Enclosure



United States Department of the Interior

BUREAU OF MINES
2401 E STREET, NW.
WASHINGTON, D.C. 20241

Dear Employer:

Recently, we wrote to you requesting your help in obtaining data for a survey for the mining industry. This information will be used to produce the characteristics of the nation's mine-worker population in order to analyze the nation's mine accident data more accurately. We have not yet received your response and have enclosed an additional survey questionnaire in case the original was misplaced or did not reach you.

Because your firm was randomly selected to represent firms of a similar size in your industry, we are making every effort to obtain your response to ensure a true representation of those firms. Your response is strictly confidential and will be used for statistical purposes only.

If you have any questions, please refer to the instructions on the first page of the questionnaire or call collect, Ms. Shail Butani at 612-725-4500. If you prefer, you may report your information directly by telephone. A response during the next 2 weeks would be great assistance to the survey.

Thank you for your help and support in the Bureau's effort to characterize the mine-worker population.

Sincerely,

Robert C. Horton
Director

Enclosure



U.S. BUREAU OF MINES
Twin Cities Research Center
5629 Minnehaha Avenue South
Minneapolis, MN 55417
(612) 725-4500

MINING INDUSTRY POPULATION SURVEY

INSTRUCTIONS:

1. Fill out this form as completely as possible and return it in the enclosed stamped envelope within three weeks.
2. This form is only for the operation with mine I.D. number as shown on the address label. Do not use for any other operation.
3. As an alternative to completing the forms, you are welcome to send copies of any administrative records, containing the requested information on *all* employees. However, it is very important that all the information requested on the forms be contained in the records.
4. (a) Obtain a list or lists of *all* the employees (hourly, salaried, managerial, and office workers, etc.) working in the operation with mine I.D. number shown on the label. It is important that each employee appear on one and only one list.
(b) Sequentially number the employees starting with one list continuing until all the lists are exhausted.
(c) Determine the total number of employees at this mine I.D. operation. Note: This number should be the same as the last number on the employees list.
(d) Based on the total number of employees, mark the appropriate employment size box below.

Total No. of Employees

Selection Numbers

- | | | |
|-----------|--------------------------|------------------------------------------------------------------------------|
| 1 — 49 | <input type="checkbox"/> | All employees (1, 2, 3, 4, 5 ...) |
| 50 — 99 | <input type="checkbox"/> | Every other employee starting with employee No. 1 (1, 3, 5, 7, 9 ...) |
| 100 — 249 | <input type="checkbox"/> | Every 5th employee starting with employee No. 4 (4, 9, 14, 19, 24 ...) |
| 250 — 499 | <input type="checkbox"/> | Every 10th employee starting with employee No. 7 (7, 17, 27, 37, 47 ...) |
| 500 — 999 | <input type="checkbox"/> | Every 20th employee starting with employee No. 12 (12, 32, 52, 72, 92 ...) |
| 1,000 + | <input type="checkbox"/> | Every 30th employee starting with employee No. 15 (15, 45, 75, 105, 135 ...) |

- (e) Record the information on the attached questionnaire for each worker whose number on the employee list corresponds to the selection numbers that fall in the above marked employment size category. Note: Depending on the total number of employees at this mine, it may not be necessary to complete all lines on the questionnaire.
- (f) See Example below.
5. If you should have any questions or need assistance in completing the form please contact _____
6. Company representative to be contacted regarding this report: _____

Name _____ Title _____ Phone () _____

EXAMPLE:

Suppose there are 153 hourly employees, 31 salaried employees, and 9 office employees at Mine Operation XYZ.

Procedure:

1. Number the workers on one list first, say office (1-9).
2. Continuously number the workers on the 2nd list, say salaried (10-40).
3. Continuously number the workers on the next list, hourly (41-193).
4. Total number of employees at Mine ID XYZ is 193. Hence, check the box inside 100-249 employees.
5. Record information for employees whose numbers are 4, 9, 14, 19, 24, 29, 34 ... 179, 184, 189.

Note: In this case, a total of 38 employees are in the sample.

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MINING INDUSTRY POPULATION SURVEY

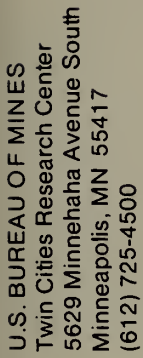
EMPLOYEE DATA:

Sample No.	Job title or occupation	Principal equipment operated (if any)	Principal operation subunit code ¹	Experience			Job-related training during last 2 years	Age yrs.	Sex		Race ²				Education ³				
				This job yrs/mo	This co. yrs/mos	Total mine yrs/mos			M	F	W	B	H	O	U	E	SH	HD	V
EXAMPLE	truck driver	truck	U SU S P O	5/3	7/0	8/6	4/10	29	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

¹ U — underground; SU — surface operations at underground mines; S — surface; P — preparation plant or mill; O — office worker

² W — white; B — black; H — hispanic; O — other; U — unknown

³ E — 1 through 8th grade; SH — some high school; HD — high school diploma; V — vocational; SC — some college; CD — college degree



MINING INDUSTRY

EMPLOYEE DATA:

[illegible]

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MINING INDUSTRY POPULATION SURVEY

EMPLOYEE DATA:

Sample No.	Job title or occupation	Principal equipment operated (if any)	Principal operation subunit code ¹	Experience			Job-related training during last 2 years wks./hrs	Age yrs.	Sex		Race ²				Education ³				
				This job yrs/mo	This co. yrs/mos	Total mine yrs/mos			M	F	W	B	H	O	U	E	SH	HD	V
EXAMPLE	truck driver	truck	U SU S P O	5/3	7/0	8/6	4/10	29	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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44.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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50.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60.			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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